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CQ RADIO AMATEURS' JOURNAL

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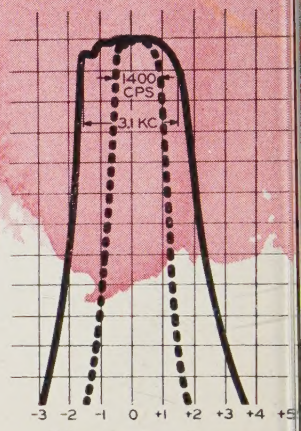
Ex-VK3OY and 'friend'

... HEARD ISLAND - 1948

Sooner or later you'll want

A COLLINS RECEIVER



Kilocycles from Resonance

Collins 75A-3 Receiver with Mechanical Filter

The Collins 75A-3 double conversion superheterodyne receiver, with its crystal-controlled front-end and highly stable low frequency VFO, is like a high frequency crystal-controlled converter working into a very stable low frequency receiver. The high stability and 3.1 kc bandwidth of the 75A-3 make it ideal for AM or single sideband — and an 800 cycle mechanical filter is available as an optional accessory for CW.

All coils are permeability tuned and have a straight-line frequency characteristic allowing linear dial calibration. Only the band in use is visible on the slide rule dial. On the vernier dial each division represents one kc except on the 10 and 11 meter bands, where each dial division represents two kc. This accurate calibration is made possible by the highly stable oscillators in the 75A-3.

The 75A-3 covers the 160, 80, 40, 20, 15, 11, and 10 meter amateur bands. Sensitivity on all bands is 2.5 mv or better for a 10 db signal-to-noise ratio. Image rejection is at least 50 db. AVC is applied to RF as well as IF stages. Separate noise limiters for phone and CW. The S-meter is calibrated from 1 to 9 in steps of approximately 6 db, and for 20, 40 and 60 db over S9. S9 corresponds to a signal input of 100 microvolts. Antenna input impedance is 50 to 150 ohms, balanced or unbalanced. A phone jack a 4 ohm and 500 ohm audio output terminals are p vided. Sockets and front-panel controls are incluc for the 8R-1 100 kc crystal calibrator and 148C NBFM adapter which are available as optional cessories. The following controls are on the 75A front panel: tuning, zero set, bandswitch, RF ga audio gain, BFO pitch, CW limiter, antenna trimm crystal selectivity, crystal phasing, mechanical fil selector, CW-AM-FM switch, noise-limiter calibra switch, on-off-standby switch. The 75A-3 opera from a 115 volt 50/60 cycle ac power source. Cabi dimensions are: $21\frac{1}{8}$" wide, $12\frac{1}{2}$" high, and $13\frac{1}{16}$" de The 19" panel fits a standard relay rack. The 75A weighs approximately 50 pounds.

Net domestic prices:

75A-3 receiver complete with F455B-31 3 kc mecha cal filter: ..... $530.
10-inch speaker in matching cabinet: ..... $20.
8R-1 crystal calibrator: ..... $25.
148C-1 NBFM adaptor: ..... $22.
F455B-08 . . . 800 cycle mechanical filter: ..... $55.
F455B-60 . . . 6.0 kc mechanical filter: ..... $55.

See Your Collins Distributor Today

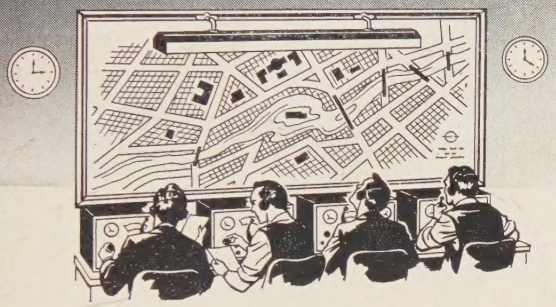
For the best in amateur radio . . .

COLLINS RADIO COMPANY

Cedar Rapids, Iowa

11 W. 42nd Street, NEW YORK 36
1930 Hi-Line Drive, DALLAS 2
2700 W. Olive Avenue, BURBANK

For dependable CD work
....G-E 5-STAR TUBES!



AT NEW LOW PRICES!

They're down as much as 50% and more from the original figures! Large-scale output has brought about substantial production savings . . . which G.E. is passing on to you in the form of plus-value prices. See your nearby G-E tube distributor!

You can't afford failures when handling civil defense. Help avoid them with 5-Star Tubes!

DESIGNED FOR RELIABILITY! Double mica spacers, doubled-staked getters, welded tab stops . . . these are three of the many special features *designed into* G-E 5-Star Tubes, so they will resist shocks and vibration.

BUILT FOR RELIABILITY! 5-Star Tube parts are individually inspected and micro-measured. Among many advanced steps in manufacture, is a special coating process on heater bends that virtually eliminates heater failures.

TESTED FOR RELIABILITY! Every G-E 5-Star Tube gets a 46-hour "burn-in" under Class A conditions. When you install a 5-Star Tube, you know it will do its job, and keep doing it!

Twelve popular types are given at right. The complete 5-Star Tube list, including subminiatures, is available at your G-E tube distributor's. Visit him today! *Tube Dept., General Electric Co., Schenectady 5, N. Y.*

Here are 12 types you will find directly useful!

STANDARD TUBES	REPLACE WITH THESE 5-STAR HIGH-RELIABILITY TUBES
5Y3-GT	*GL-6087—full-wave rectifier.
6AK5	GL-5654—sharp-cutoff r-f pentode.
6AL5	GL-5726—twin diode.
6AQ5	GL-6005—beam power amplifier.
6AU6	GL-6136—sharp-cutoff r-f pentode.
6BA6	GL-5749—remote-cutoff r-f pentode.
6BE6	GL-5750—pentagrid converter.
6C4	*GL-6135—medium-mu triode.
6SK7	GL-6137—remote-cutoff r-f pentode.
6X4	*GL-6202—full-wave rectifier.
12AT7	GL-6201—h-f high-mu twin triode.
12AY7	*GL-6072—low-noise high-mu twin triode.

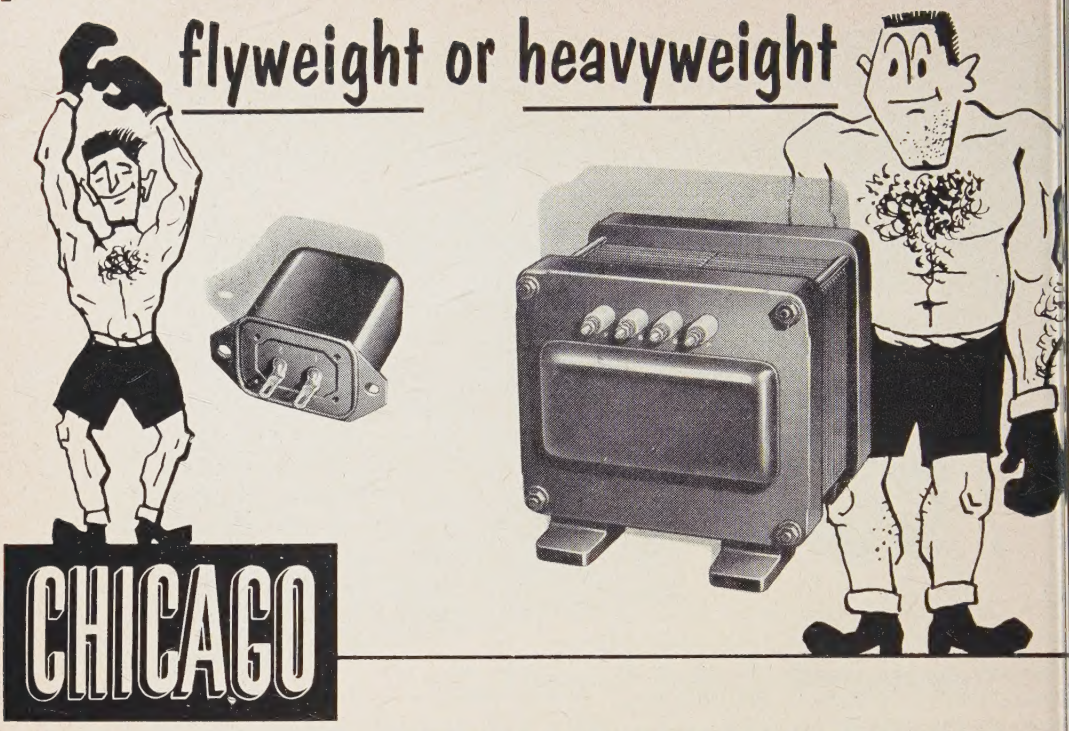
**Slight electrical difference.*

● General Electric wishes to congratulate the winner of the 1953 Edison Award, J. S. Surber, W9NZZ, Peru, Indiana. For sacrificing hours of his time day-in and day-out to keep remote arctic weather station men in touch with their families, Mr. Surber was adjudged the amateur whose public service was the most noteworthy. Radio amateurs everywhere can feel honored by this tribute to a member of their group.

GENERAL ELECTRIC

166-182

flyweight or heavyweight



CHICAGO

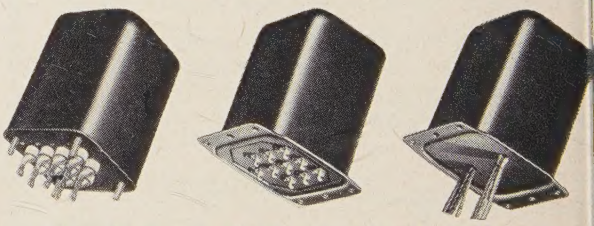
builds the world's TOUGHEST TRANSFORMERS

A Complete Range for Every Need: From "flyweight" Chokes to "heavyweight" Modulation bruisers, CHICAGO "Sealed-in-Steel" transformers are *really rugged*. Talk about "torture"—these units can "take it," and deliver full rating and continuous, dependable service under the toughest conditions. Your electronic parts distributor can supply the *complete* CHICAGO "Sealed-in-Steel" line for *every* circuit requirement: Power, Bias, Filament, Filter, Audio, MIL-T-27, Step-down, etc.

There's Nothing Tougher than the "Sealed-in-Steel" New Equipment Line

CHICAGO'S one-piece drawn-steel cases are the strongest, toughest, best-looking transformer construction available. The one-piece seamless design (in a choice of 3 mountings) enclosing an electronically perfect unit, provides the best possible electrostatic and magnetic shielding, with *complete* protection against adverse atmospheric conditions. Whether your transformers must pass the most rigid MIL-T-27 specs, or are intended simply for average applications—*play safe*—choose CHICAGO "Sealed-in-Steel" transformers.

Free CHICAGO Catalog—You'll want the full details on CHICAGO'S *New Equipment Line*, covering the complete range of "Sealed-in-Steel" transformers for every modern circuit requirement. Write for your Free copy of Catalog CT-153 today, or get it from your electronic parts distributor.



AVAILABLE IN 3 VERSATILE CONSTRUCTIONS

H-TYPE
Hermetic sealing meets all MIL-T-27 specs. Steel base cover is deep-seal soldered into case. Terminals hermetically sealed. Ceramic bushings. Stud-mounted unit.

S-TYPE
Steel base cover fitted with phenolic terminal board and pressed into base. Convenient numbered solder lug terminals. Flange-mounted unit.

C-TYPE
With 10" color-coded leads brought out through fibre coard base cover. Lead ends are stripped and tinned for easy soldering. Flange-mounted unit.

CHICAGO STANDARD TRANSFORMER CORP.

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Vol. 10, No. 3
MARCH, 1954

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BRANCH OFFICES

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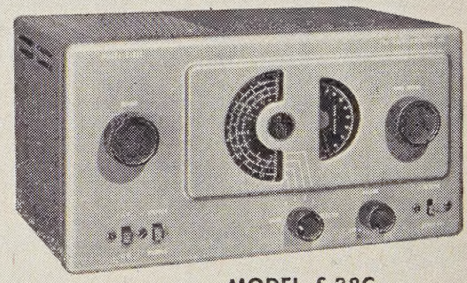
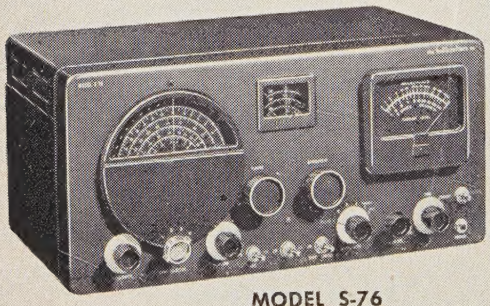
hallicrafters

MODEL S-53A



MODEL S-38C



MODEL S-76

MODEL S-40B

Here are the high performance—high value instruments that have made the hallicrafters name best known among amateurs around the world!

As an amateur operator, you know there is no substitute for performance in a receiver. Either a rig pulls in the signals or it doesn't. That's why we urge you to compare Hallicrafters receivers—model for model and dollar for dollar—with *any* others on the market. We know that when you do you'll choose Hallicrafters—because comparisons like that are what have built our business and reputation. A reputation backed by expert operators all over the world.

MODEL S-38C. The radio that amazes even the experts! Offers world-wide reception for the short-wave listener and the new radio amateur even in weak signal areas where ordinary sets fail. Covers Broadcast Band 540-1650 kc *plus three short-wave bands* covering 1650 kc-32 Mc.

Electrical band spread plus high gain circuitry makes tuning even on crowded bands a snap. Really pulls in distant, weak signals. Headfone tip jacks on rear and built-in PM speaker. Oscillator for reception of code signals.

Gray steel cabinet 12⅞" x 7" x 7¾" deep. Shipping weight 13 lbs. Four tubes plus rectifier. **$49.95**

MODEL S-53A. The finest small communications receiver built and ideal where maximum performance is required in small space. Several steps better than the S-38C, but not quite up to larger S-40B. Covers Broadcast Band 540-1630 kc *plus four short-wave bands* covering 2.5-31 and 48-54.5 Mc.

Electrical bandspread tuning control to separate stations on crowded bands, with calibration for 48-54.5 Mc. Two i-f stages. Panel switches control automatic noise limiter, code reception and high-low control. Phono jack for records. Headfone tip jacks on rear and built-in PM speaker. Temp. compensated to reduce fading due to frequency shift.

Satin black steel cabinet with brushed chrome trim. 12⅞" x 7" x 7¾" deep. Shipping weight 19 lbs. Piano hinge top. Seven tubes plus rectifier. **$99.95**

MODEL S-40B. Long a favorite with amateurs. A big set with big set performance at a modest price. The largest set in the Hallicrafters line, with its own built-in speaker. Covers Broadcast Band 540-1680 kc *plus three short-wave bands* covering 1680 kc-44 Mc.

Electrical bandspread tuning control to separate stations on crowded bands. One r-f, two i-f stages to draw in stations. Switches for automatic noise limiter, code reception and three position tone control. Code pitch control and built-in speaker.

Satin black steel cabinet. 18½" x 8⅞" x 9½" deep. Shipping weight 36 lbs. Piano hinge top. Seven tubes plus rectifier. **$119.95**

MODEL S-76. Value packed, double conversion communications receiver with Broadcast Band 538-1580 kc *plus three short-wave bands* covering 1720 kc-34 Mc.

Electrical bandspread tuning control with calibrated dial to separate stations on crowded bands. Double superhet with 50 kc second i-f and giant 4-inch "S" meter. Five position selectivity, one r-f, two conversion, two i-f stages, temperature compensated. Phono input jack. 3.2 or 500 ohm outputs. Socket for external power or remote control.

Satin black steel cabinet with chrome plastic trim rings. 18½" x 8⅞" x 9½" deep. Shipping weight 41 lbs. Piano hinge top. Nine tubes plus voltage regulator and rectifier. **$199.95**

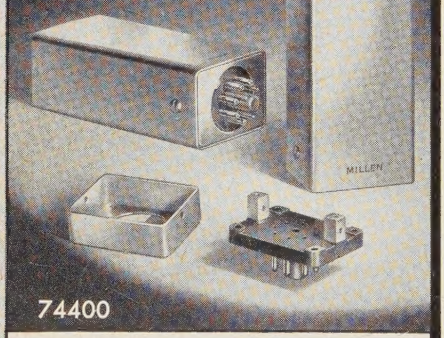
hallicrafters—

THE NAME IS FAMOUS — RADIO · TELEVISION · HIGH FIDELITY

4401 West Fifth Avenue, Chicago 24, Illinois • Hallicrafters Ltd., 51 Camden Street, Toronto, Canada

Designed for

Application



The No. 74400

Shield Can *with* Octal Plug-Base

The versatile No. 74400 unit comprises an extruded rectangular aluminum shield 1 7/16" x 1 7/8" x 4 1/2"; a low loss brown phenolic octal plug base to fit, and a base shield to further extend the shielding. Designed for mounting filters, tuned circuits, relays, IF transformers, audio components, complete midget amplifiers or other circuits, etc.

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS

Mud Flats, Ari

Dear Hon. Ed:

You are remembering me, is it not so? Good ol lovable Scratchi? The Arizona geenyus? I hopin for certainly you are remembering. This are on acc I are in 1/c trubble. Hon. Ed., I are feeling lowe than 160 meter longwire antenna after sleet storm

Scratchi are in the jug, and I not meening cacktu jooce jug. I meening local pokey—jale to you. Thi are posilutely the only letter the Hon. Sheriff lettin me riting this munth, so for gracious sakes aliv please answering posthasty air-male speshul rush The reason for this is . . . . but I better starting a commencing point.

Too days ago I deciding to take a walking tri thru desert in ordering to get sum exersize. Ar planning to reely ruffing it, camping out, and hav ing big old times. Are asking Boozum Buddy if h are likesame to communing with Naychure. Old Boozum Buddy thinking things over, and saying h cuming if I taking along portable 2-meter gear. Thi old B. B. are feller who not getting amchoor license on acct. he to lazy to studying. I gess he figgering he can doing sum bootlegging on 2 meters on thi trip.

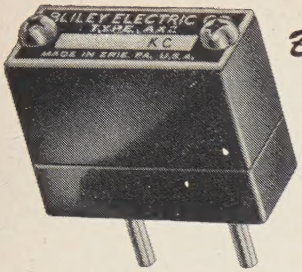
First day things going reel peechy, and we both a happy as mouse in bran barrel. Sun are warm, sk are clear and feet not hurting. We stopping eve now and then and cranking up 2-meter rig an getting a cupple short QSO's. Are even finding nic spring to refilling canteens. In fack, things were going to good. Thinking back on it, this are poin when Scratchi shud be getting worried. When thing running to smoothly, watching out, is my motto.

Second day sun are cuming up rite on skedyule so out we setting again. By noon portable rig getting heavier and heavier, and QSO's getting fewer an worser. I telling old Boozum Buddy we walking our selves rite out of QSO range, but he saying not t worrying—we are hedding for mountens. When get ting higher in air we increasing range. I are tired at this point but having to agree with his filosofey.

The going up the mounten are just to about t beings reel ruff, when we rounding a big bolder and seeing most amazing thing. You are not buleevin it, Hon. Ed., but rite there in plane view are brand new hellycopper. We walking up to its, and findin nobuddies around. Old B. B. and I deciding it be longing to sum rancher, as hellycopper are named after snake. Rite on both sides of ship are name "ASP." It are a reel bewty, and Scratchi and B. B. are climeing inside and looking round.

First thing I knowing, old B. B. are pressing a button or two, motors are starting, and hellycopper

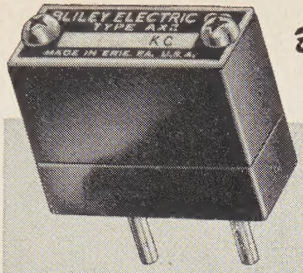
(Continued on page 8)



Bliley TYPE AX2

RANGE (kc)	TOLERANCE (kc)	PRICE
1803-1822 1878-1897 1903-1922 1978-1997	±1	$3.75
3500-3997	±5	$2.95
7000-7425 8000-8222	±5	$2.95
12500-13615 14000-14850	±30	$3.95

On crystals supplied to the tolerance above, the nameplate frequency is calibrated to ± .002% in factory test equipment. The drift is less than .0002% per °C.

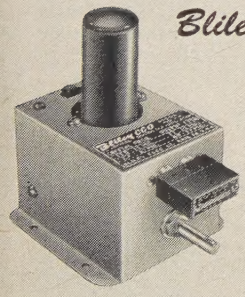


Bliley TYPE AX3

RANGE (kc)	TOLERANCE (kc)	PRICE
24000-24333 25000-25500	±5	$3.95

Specially designed third overtone crystal produced for the Bliley CCO-2A oscillator. On crystals supplied to the tolerance above, the nameplate frequency is calibrated to ± .003% in factory test equipment. The drift is less than .0002% per °C.

Bliley Crystals FOR 23 YEARS TOP AMATEUR CHOICE . . .

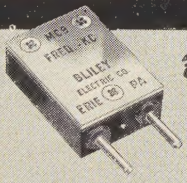


Bliley TYPE CCO-2A

This famous packaged oscillator unit was designed and engineered to utilize the many advantages of crystal control on 2-6-10-11 meters. With the CCO-2A, output is obtained directly on 6-10-11 meters; operation on 2 meters requires only a tripler stage.

Specified for 10 meters and 11 meters is the Bliley type AX2. For 6 meter operation, use Bliley type AX3. On 2 meters, select an AX3 crystal which will triple to the desired transmitting frequency.

PRICE: $11.95 (Less Tube and Crystal)



Bliley TYPE MC9

SPOT FREQUENCIES *for* NET OPERATION

RANGE (kc)	TOLERANCE (kc)	PRICE
ANY SPECIFIED FREQUENCY BETWEEN 3000-10000	±.03%	$4.80

On crystals supplied to the tolerance above, the nameplate frequency is calibrated to ± .002% in factory test equipment. The drift is less than .0002% per °C.

You will find these famous Bliley amateur products described in Bulletin 44-A—now available at your favorite distributor of amateur equipment.

Bliley CRYSTALS

BLILEY ELECTRIC COMPANY

UNION STATION BLDG., ERIE, PENNSYLVANIA

Here's the new SHURE

SLIM-X

All-Purpose Crystal
MICROPHONE

MODEL 777
List Price $21.00
MODEL 777s (with switch)
List Price $23.00
(Price includes cradle for mounting on stand)

Its Versatility and "Hand-a-Bility" give you an ideal low-cost all-purpose microphone

SLIM STURDY Smart

LIGHT! The new "777" Slim-X Microphones are rugged little microphones weighing only 6 ounces! They are designed for good-quality voice and music reproduction. Their versatility and "hand-a-bility" make them ideal for use by lecturers, announcers, instructors, and Hams; for audience participation shows; carnivals; panel and quiz shows; and use with home-recorders. When mounted on either cradle or swivel, the "777" can be removed in a flash (no tools necessary)—simply by lifting it out of the holder. This makes it an ideal "walk-around" hand-held microphone.

TECHNICAL INFORMATION: Smooth frequency response—60 to 10,000 c.p.s.; special-sealed crystal element—for long operating life; high impedance; 7′ single-conductor cable, disconnect type. Dimensions: (Microphone only) Length, 4½″; Diameter 1″. *Finish:* Rich satin chrome overall.

NOTE: Lavalier cord for suspension of Microphone around neck is included.

ACCESSORIES FOR "777"

MODEL S38 STAND is a heavy die-cast base. Includes metal screw machine stud for connecting microphone adaptor to stand base.
List Price: $3.30

MODEL A25 SWIVEL ADAPTOR features a long-life, high-quality swivel connector. Is lined with a long-life nylon sleeve—for noise-free and scratch-free insertion and removal of microphone.
List Price: $5.50

SHURE

SHURE BROTHERS, INC.
Manufacturers of Microphones and Acoustic Devices
225 W. Huron St. • Chicago 10, Ill. • Cable Address: SHUREMICRO

(from page 6)

are zooping up rite off ground. As we going up, ol B. B. are saying we can reely working DX on meters band if getting up to few thousand feet After I managing to sitting down and catching breat I asking him if he knowing how to flying hellyco per. Now he tells me he used to driving one Yewnited State Marine Corpse!

Rite here, Hon. Ed., I know what you are think ing. You are thinking of old stoopid Scratchi lettin his old B. B. flying up in hellycopper. Hackensaki! Hon. Ed. what are you doing in my place? Here am, 200 feets in air, and not knowing the gear shi on a hellycopper from a oxygen mask. Let's facin it—I were being taken for a ride.

Being taken for a ride, howsumever, are not pr venting good old Scratchi from enjoying the rid Not on your variable condenser. Wow!! Wha seenary. And what signal strengths we heering o 2-meters band. Old B. B. so busy working rig an flying hellycopper he losing track of time. Also lo ing track of where we are. One mile up and los Also having big problem on acct. it getting dark Finely B. B. solving problem by landing hellycoppe near road intersection. After landing, Scratchi walk ing one way and B. B. other way to finding sumon

Hon. Ed., that were the shortest walk I ever takin This car pulling up, asks if I cuming from helly copper, and when I saying yes, I are whisked int car. Next thing I know are staring out of jale cel Presently are charged with steeling state propert hellycoppering without hellycopper license, and ad ing alien to escape. You think they meening old B. B.

So, there are my 1/c predickament. Hon. Sheri kinda buleeving my story, but he won't releasing m until I are indemnified. Hon. Brother Itchi not hom so I left on your tender mercies. For gracious t Saki, writing to Sheriff, Mud Flats, Arizona, an telling him who Scratchi is, will you, Hon. Ed? I so doing I be so happy I even subscribing to you Hon. Rag, instead of bying it secondhand at Joe Triple-Dip Hunky-Dory Ice Cream and Used Maga zine Parlor.

And by the way, that hellycopper not named fo snake. Remembering that ASP? That standing fo Arizona State Police. They out hunting aliens i hellycopper, and we stranding them in mounten.

Please RSVP'ing pronto-like.

Respectively yours
Hashafisti Scratch

? ? ? ? ? ? ?

Our circulation manager informs us that he has o hand eight dollars which his conscience won't quite allo him to spend. This money, he says, belongs to variou people who have sent in their remittance, either for C subscription or RADIO AMATEURS' MOBILE HAND BOOK orders, but who have neglected to identify them selves, thereby making it impossible for us to establis them on a mailing list. He tells us that he has received

$2.00 for a HANDBOOK order from Walla Walla, Wash., dated January 26, 1954.

$3.00 for a 1-year subscription to CQ from East Aurora, N.Y., dated January 25, 1954.

$3.00 for a 1-year subscription from St. Cloud, Mich., dated Dec. 10, 1954.

If you've failed to receive that subscription or RADI AMATEURS' MOBILE HANDBOOK that you sent fo inspect these items carefully, and write our subscriptio department if you think that one might be yours. Afte all, we're not a charitable organization.

A Change ..for the better

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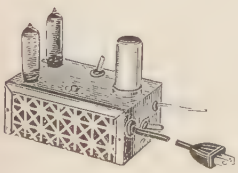

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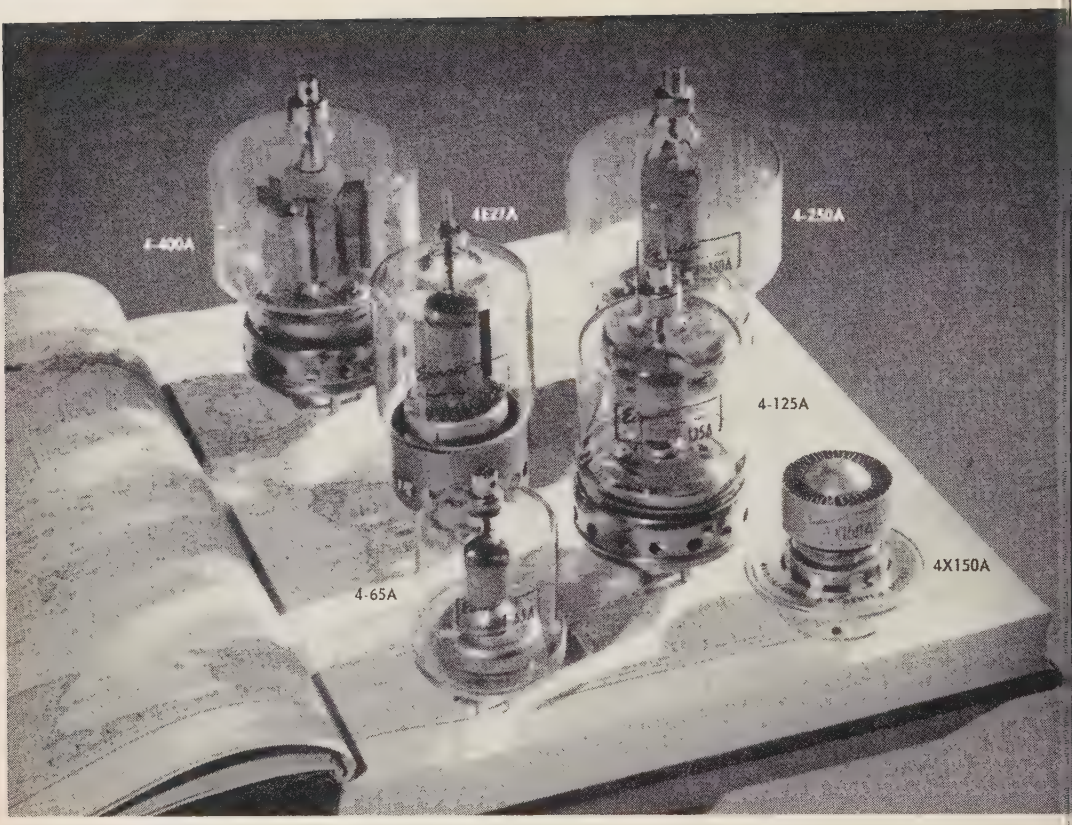

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4-125A	144mc	3.3w	2.5w	380w	500w
4-250A	50mc	3.2w	2.6w	675w	1000w
4-400A	50mc	3.5w	6.1w	825w	1000w
4X150A	420mc	2.0w	1.2w	200w	250w
4E27A	144mc	2.0w	1.6w	380w	500w
		Suppressor Grid Modulated			
4E27A	144mc	1.2w		180w	

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Zero Bias . . .

Re "Security" and the January Editorial

The immediate reaction to the *ZERO BIAS* editorial in the January issue was widespread to the extent that a large number of letters suddenly appeared on the desk of Senator Alexander Wiley (Wisc.). As many of our readers will recall, this particular editorial dealt with the newspaper stories, attributed to Senator Wiley, that radio Hams could be a "security" risk. In the editorial we attempted to point out that there was some question as to whether Senator Wiley was actually referring to Hams, or to the total number of people in the United States licensed to operate radio equipment.

Fortunately, Senator Wiley did take the time and trouble to amplify and straighten out the record of his oral discussions about "security" and Ham radio. In that vein we are pleased to reprint below the entire "open letter" released by the Wisconsin Senator. In it our readers will find good cause to calm their fears that our privilege of Ham radio may be revoked in order to implement national security. As a whole, this "open letter" is quite appreciative of our hobby and expresses a gratifying interest and knowledge of amateur radio operation and the Hams in general.

But on the unfortunate side we must once again point out that the news services and gossip columnists have misinterpreted these remarks on "security." In mid-January a well-known woman columnist stated that Ham radio was soon to be investigated by a congressional committee because it was furthering the Communist cause.

It would appear that somewhere along the line the job of publicizing the Ham and acknowledging our sincere interest in the country is *being left undone.* Surely it has not fallen to the level of each individual acting on his own—or has it?

o.p.f.

To the Editor,
CQ Magazine,
67 West 44th Street,
New York, New York

Dear Sir:

My attention has been called to an editorial in your January 1954 issue, entitled "Zero Bias," in which reference was made to my comments on the question of radio security regulations.

I am glad to have this opportunity to set forth a number of facts in which I know you and your readers will be interested.

I am incidentally sending this Open Letter to those folks who have kindly inquired about the problem, as well as to the Officers of the American Radio Relay League, the FCC and other interested sources.

Hams' Patriotic Record

In the first place, I have personally stated so often that it hardly needs repetition now—that the people of the United States are tremendously indebted to our amateur radio operators.—Their patriotic efforts in time of war and peace have been so numerous as you know so well, as to be a source of deepest pride to every thinking American.

I have stated that "Hams" represent for us a great national asset—an asset which grows in value as

(a) more and more electronic miracles emerge in this age of science, and

(b) as we guard against all the contingencies of this dangerous Atomic Age.

Ham contributions to civil defense, to disaster recovery, to armed forces radio work—provide a bright record which no thinking person would possibly dispute.

Faithful Self-Policing

Second, I am more than familiar with the exceptional record of Ham self-policing—the splendid degree to which Hams, in cooperation with their associates, faithfully abide by technical regulations.

Third, security for our country against enemy use of electronics equipment in our own midst—is obviously a highly complicated, diversified problem—which is infinitely bigger and broader than simply the phase of amateur radio.

Advantages and Disadvantages of Possible Regulations

Fourth, is is quite obvious that, if there were any new Federal security regulations considered, relating to amateur radio operators, among others, the regulations would have to be explored first with the greatest care—to make certain that the advantages of the proposals would outweigh any disadvantages—inconveniences and cost.

No one has even suggested making an investigation, as such, of all amateur radio operators, because not only would such a procedure be fantastically costly, but it would be obviously unjustified.

The very raising of the question of security, obviously, is really intended only in connection with a tiny potential percentage of amateur radio operators who may—I emphasize—MAY—be of questionable loyalty.

If there are possibly some few security risks among Hams, it should not surprise anyone; it would not reflect in the slightest upon the good name of the overwhelming percentage of Hams, any more than the security risks who are obviously present among other segments reflect on those segments as a whole.

Every thinking American realizes that no group is or could be 100 per cent immune to Communist infiltration. That is particularly true of a vast group in a sensitive field of communication. Blindly to contend otherwise would be absurd.

Reds Already Disclosed Interest in Radio

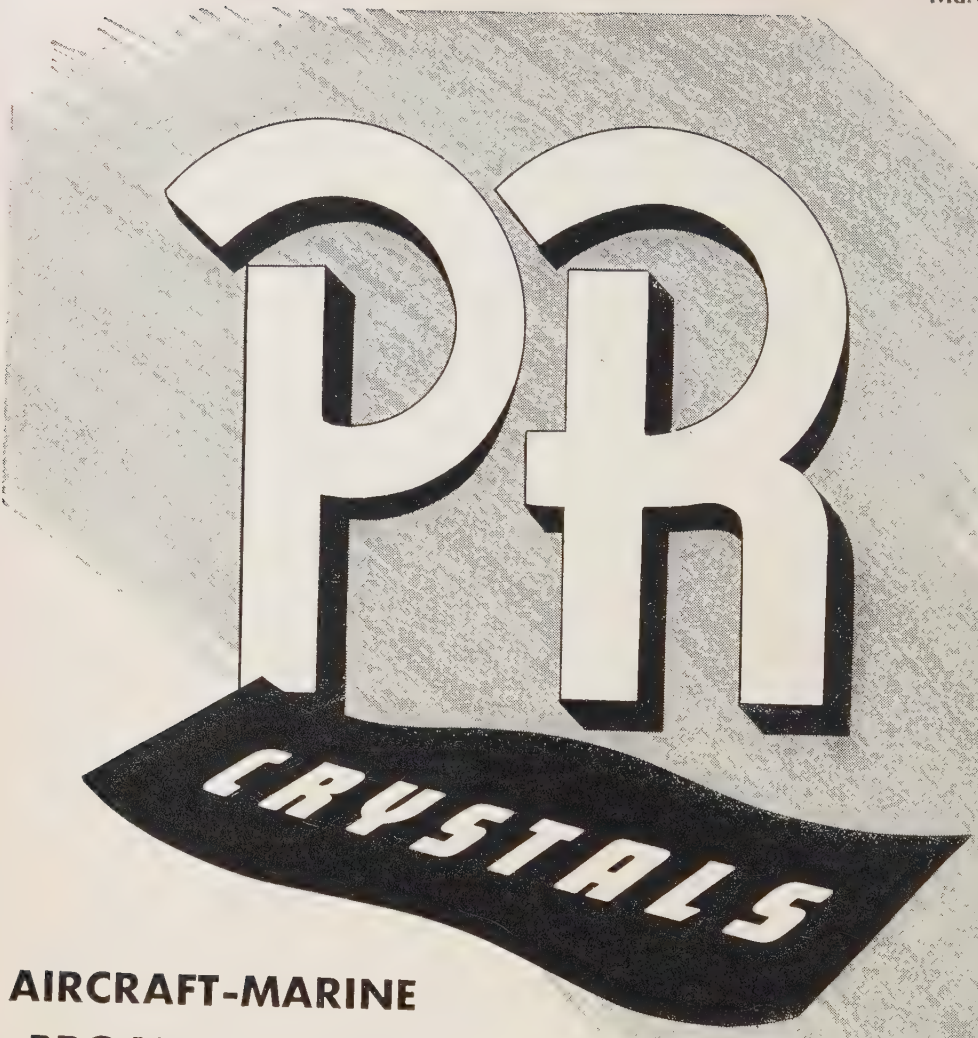
Now, I ask you, my friends, is it idle conjecture that Communists would like to utilize amateur radio for their foul purposes? Of course not!

In the first place, in the historic decision of the Subversive Activities Control Board against the Communist Party of the United States, direct reference is made to the fact that the Communists are keenly aware of the significance of amateur radio for their treacherous operations.

I quote from Page 109 of Senate Document 41, 83rd Congress, on the Decision of the Board:

"In the summer of 1949, instructions were given and steps were taken by Respondent's (i.e. the Communist Party's) leaders to establish a national system of radio communication for use by the Party on a standby basis. The establishment of this system involved the acquisition of radio receivers, familiarization with the use of radio equipment, plans for the location of mobile transmitters and receiving equipment, and a search to find amateur radio operators among CPUSA members. In ad-

(Continued on page 50)



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The VK1 Story

ROTH JONES, VK3BG

c/o "The Age," Melbourne, Victoria, Australia

Exclusive Story!

An Outstanding Australian Journalist Who Frequently Writes on the Antarctic and Scientific Subjects Tells the Story of These Isolated DX Stations

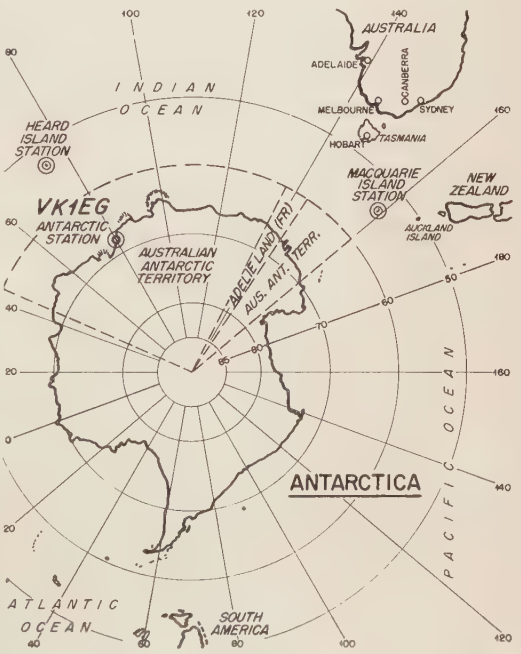
In the immediate post-war period Australia planned to establish scientific bases at its two major southern islands, Heard and Macquarie, to collect scientific data and train men in Antarctic exploration and research. Their major goal was to accumulate sufficient data and practical experience so that a permanent base in the Australian sector of the Antarctic continent could be established.

This has now been accomplished. An Australian party was due to land at MacRobertson Land, somewhere between 65-70 degrees south and 55-80 degrees east in the Australian sector, late in January. From Heard and Macquarie Islands and now MacRobertson Land has and will come the call prefix VK1. This is the story of the men behind it who are noted for their good operating, and their interesting and apparently never ending topics of conversation about the south, its potentialities, and problems.

The *Australian Postmaster General's Department,* which is in control of amateur radio in Australia, has issued a number of Ham licenses to members of these expeditions. Some have taken out new licenses, although the majority have taken their Australian mainland calls south and prefixed it with VK1. All have been very active and the majority have made WAC.

Macquarie Island is in zone 30. It has an area of about 70 square miles and is 1000 miles south of Hobart, capital of VK7, on a latitude of 54.5 degrees and longtitude 159 degrees east. There are no very high mountains within the vicinity of the camp and all round DX has been possible when conditions have been favorable. It has a rocky, kelp strewn coastline dotted with numerous wrecks including an old Spanish galleon. The highest point is 1450 feet above sea level.

Heard Island is a little more remote from Australia. It is on latitude 53 degrees south and longitude 73.5 east in zone 39, or about 2400 miles southwest of Perth, the capital of VK6, Australia's most western call district. Heard Island is almost three times as big as Macquarie Island, and the scientific base there is said to be the windiest habitation on earth. Wind velocities have reached 120 miles per hour and 90 mile per hour gales are common. Towering above the camp is 9000 foot high Big Ben, a snow capped active volcano in line with the long path to Europe and no doubt a contributing cause to the difficulty of regular contact with those countries. It is frequently isolated from the world for days at a time due to radio blackouts despite the efforts of a high-powered commercial transmitter and a rhombic beamed on Australia.



Spotting the three VK1 locations.

When the Australians manned the two islands in 1948 they were then both uninhabited, but sealers had visited them off and on as far back as the 1850's when Australia was beginning to expand as a nation. There had never been a radio station on the islands before.

Australian Help For VK1

Both the *Postmaster General's Department* and the *Antarctic Division* of the *Australian Department of External Affairs,* which is in charge of Australian Antarctic exploration, have taken a sympathetic and encouraging attitude to amateur radio. Both organizations have looked upon it as a morale builder, a private link between the members of the expedition and their homeland—a chance to get their minds away from the routine of a polar expedition which can become monotonous. The faith of these two responsible Australian organisations in amateur radio has been justified; Amateur radio has helped kill the monotony and drudgery of the lonely south.

The *P.M.G. Department* and the *Antarctic Division* have insisted that the operators take their own equipment. In nearly every instance this has consisted of an all-band transmitter running the Australian 100-watt maximum input and operating on CW and 'phone. Most of the receivers have been highly selective double-conversion supers with an efficient noise limiter —a necessary adjunct during solar and magnetic storms.

Licenses to operate at VK1 have been issued by the *P.M.G. Department* without any test to some of the personnel, provided they agree not to operate the equipment unless one of the licensed radio men is nearby. It is impossible for more than one station to be operating at one time and usually the licensed amateur radio men share the one set of equipment. At times, by prior arrangements, it has been left behind for the oncoming party.

Amateur band communication at Heard and Macquarie Islands differs little from the Australian mainland conditions, although VK1EG expects to have vastly different conditions on MacRobertson. In the summer months Heard and Macquarie Islands have regular night openings to Europe and our winter openings to the States in the afternoons. Aurora and solar magnetic disturbances, however, make conditions a little unreliable. When the bands have been open to Europe and stateside the VK1's have always had to penetrate the VK mainland QRM, like a KH6 trying to work Europe when every W1 to WØ is getting through to Europe as well.

Oddly enough, South America has been difficult to work from Heard Island and South Africa almost as hard to raise from Macquarie. Nevertheless, WAC has often been made in under an hour when conditions have been good.

Operating periods at Heard and Macquarie Islands (and no doubt more so at MacRobertson Land when it gets going) are dictated by the round the clock commercial schedules to the Australian mainland with administrative and meteorological information. The three bases run a well equipped meteorological station and the radio operators generally work 24 hours on and 24, 36 or 48 hours off depending on staff requirements and local administration, etc. During their 24 hours on they mix their amateur radio with traffic. When a VK1 says "Can't wait now" *he* means it. He just must throw the big switch to keep a commercial schedule.

VK1RG Equipment

Antennas are up to the operators themselves. During VK1RG's sojourn at Macquarie Island in 1952, he erected a *Lazy H* 70 feet high beamed on Australia, Asia and Europe, and a four wavelength long wire, also 70 feet high, for stateside. There's plenty of room for antennas at VK1. Some of the VK1's have been satisfied with a dipole but normally have it up at least 70 feet attached to the big poles which support the commercial rhombic.

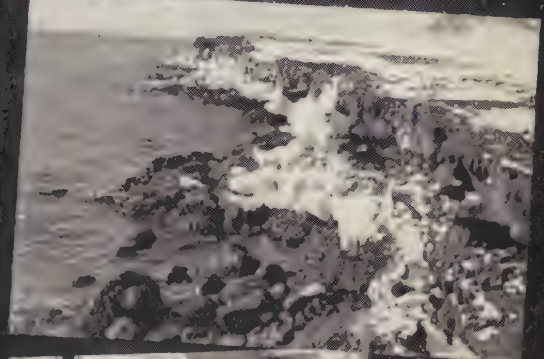
VK1's operate on all bands 80 metres down to 6 metres and choose the band that best suits their operating time. To date there has been no contacts on 6 metres. Latest ionospheric information is available from their own ionospheric recorder or the prediction information transmitted from the mainland every few days.

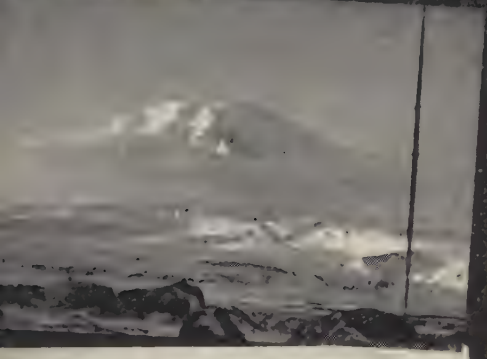
VK1RG's operating is typical of the VK1's who have manned the island in recent years.

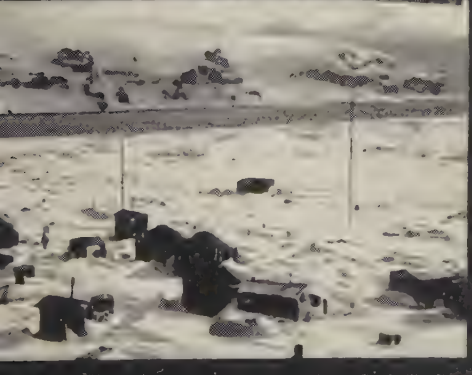
At the right are a number of views of Heard Island, the equipment and the operators. In the upper right photograph; Allan Campbell-Drury, VK3ACD, is shown with J. Lambeth, geologist, during a trek through the snow. VK3ACD (on the left) was the first to operate from VK1. He used a surplus Mark III transceiver on 40 meters to contact VK6QF. His first stateside contact was with W6YC also on 40. In the right center photograph we see a portion of the coastline during the summertime. This was taken some 200 yards from the camp. In the lower right the commercial side of VK1 is pictured. Kevin Johnson, VK1KI, sends traffic while Nils Lead, VK1NL (left) and John Gore, VK1PG, stand by.

The upper left panel photograph shows Roan Oatt, VK1VU, testing an Australian AR7 receiver during the 1949 manning of Heard Island. The center left photograph is a remarkable view of 9000-foot "Big Ben." This mountain is still unclimbed, despite several attempts by the various expeditions. One of the antenna poles is at the right in this photo. The last picture (lower left) shows the camp itself and was taken by VK3ACD from atop one of the antenna poles. The cloud just rolling over the hill in the background soon enveloped the camp.

HEARD ISLAND







Not a Ham in the usual sense of the word, P. G. Law (left) was the leader of the Australian Antarctic Expedition and made it possible for VK1 stations to operate with such liberty. On the right, Bill Storer, VK1EG is pictured just before embarking on January 4th for MacRobertson Land.

Most of his work was on 20 metres 'phone and CW to as many countries as he could work. He worked VK/ZL on 40 metre 'phone, and W's on CW. His work on 80 during the long winter nights was limited to phone to VK/ZL and CW to the W's. On 15 and 10 he worked what was offered and limited himself to a few W's and KH6, all on phone.

It has not all been the Garden of Eden we in civilisation might be led to believe by the huge antenna arrays and white snow in the pictures. Noise level is always high in these regions. Radio blackouts are frequent, often for days at a time. During solar and magnetic disturbances communication is possible only with extreme difficulty. Oddly enough, as the noise on the higher frequencies increases and the signals are fewer, stations from Australia and New Zealand on the broadcast band come through more clearly.

The snow blizzards and the roaring gales, often up to 125 miles per hour and frequently around the 100 mark, have broken dozens of antennas despite their rigid construction and the use of 12 gauge hard-drawn copper wire. Breaking of the wire due to ice formation and the cracking of insulators (due to the different rate of expansion of the insulator and the wire) are common. Static sometimes obliterates the whole band.

Temperatures vary between as low as 15 degrees (F) to a maximum of 50 degrees (F) at Heard and Macquarie Islands. This is cold according to Australian standards. At MacRobertson Land temperatures this winter (May, June and July) are expected to drop to zero (F). *(Don't tell me that isn't cold W1FH).*

1500 Miles From South Pole

Years of Government planning and generations of explorers' slaving and suffering are behind Australia's first permanent base on the continent of Antarctica, which is perhaps the best equipped polar base in the world today. *(Attention WAC certificate distributor. Why not make WAC hard and include Antarctica in it!!!)*

The journey of VK1EG to the Antarctic continent is a new chapter in Australia's amateur radio history, which is already filled with many interesting accomplishments and achievements. Close to latitude 70 degrees south, VK1EG will be nearer to the South Pole than any other amateur radio station in the world—only 1500 miles away.

Mr. W. J. "Bill" Storer, VK1EG, needs no introduction to amateur radio. As VK2EG, he is a well-known member of the Australian DX fraternity. He is 28 and was at Macquarie Island for 12 months as VK1BS and, like most of the other nine members in the Antarctica party, had sound experience in World War II. He served with the Royal Australian Navy from New Guinea to the Philippines. He is primarily a CW man but has taken a modulator south with him. His rig will run about 80 watts and he intends operating on 80, 40, and 20 metres.

His shack will be in a little corner of the commercial operating room which is an iron hut, well pegged down to withstand the gales and blizzards, on a low rock platform between ice cliffs of MacRobertson Land. His antennas will be silhouetted against a backdrop of glaciated peaks and sheltered by small islands free of ice in summer.

Intensely fond of the Antarctic, Bill will have much to satisfy the inquiring mind of his colleagues from many countries, if time permits him much operation on the amateur bands.

On his departure from Melbourne Bill said he hoped to be on the air by mid-March. He wanted to work as many stations as possible and would QSL them all. His QSL will be a prize in any DX operators shack. He has first to get his masts up and his kilowatt commercial transmitter operating before he can commence his amateur radio operations.

View of the Macquarie Island camp.

This photo was taken on December 18, 1948 when Allan Campbell-Drury, VK3ACD celebrated his thirtieth birthday. The occasion merited the donning of a full-fledged civilian suit (the first time in his 12 months at bleak Heard Island). The transmitter-receiver unit is a war surplus Type III Mark II with a power of about 4 watts into a length of wire.

The grandly beautiful seventh continent encircles the South Pole for an area of nearly 6 million square miles, larger than America and Australia combined. Less than one-tenth has been surveyed; and Australia claims 2,472,000 square miles of it.

Following the *Australian Antarctic Territory Acceptance Act* of 1933 Australia accepted from the United Kingdom the whole sector bounded by the meridians 45 degrees east and 160 degrees east long. and the parallel of 60 degrees south with the exception of the narrow strip of French territory Adelie Land which lies between meridians 136° and 142° east longitude.

British sovereignty, vested in Australia by this Act, was based on a long list of discoveries and exploration work dating from the first discovery of land in this sector by John Biscoe in 1931, to the charting of large sections of the Antarctic continent by the *British Australia and New Zealand Antarctic Expedition (BANZA)*, under Sir Douglas Mawson, in 1929-31.

MacRobertson as a New Country

If it has not already been done the writer strongly recommends to the sponsors of the country's lists and the *DX Century Club* organisers that VK1's from MacRobertson Land or any other part of the Australian sector be classified as a new country.

Except in January and February when the party will be relieved each year and a new VK1 call introduced to the Antarctic continent, most of the sheer coast is girded by icebergs—often up to 30 miles long—and dense pack ice extending at times 250 miles out to sea. One third of the 14,000 miles of coastline has never been reached by ship although it has been roughly plotted from the air.

To the best of the writer's knowledge amateur radio has never before been to the Antarctic continent except for a brief spell with the French expedition to Adelie Land in 1951 and the American expedition to Little America. Fewer than 1000 humans have wintered in the last unknown continent's loneliness and past expedition work from Australia has always been on a short term basis. It is 40 years since Australia had a station there.

From now on, however, it will be permanent, and VK1 will always emanate from these icy wastes, knowing that if an emergency should strike and communication from the normal commercial channels collapse, there will always be the amateur bands to help them out.

MacRobertson Land is no further from Melbourne or Sydney, Australia, than say Chicago to San Francisco. It can never be wiped off the DX man's calendar as "uninhabited." All the previous expeditions from Australia have been primarily concerned with exploration and investigations into a possible whaling industry, but this new expedition will be scientific, not commercial. Some of Australia's most brilliant scientists will, if time permits, be talking from VK1EG to the world. For the DX man working VK1EG who wishes to learn more of the Antarctic these facts are worth noting:

Australia does not apathetically dismiss these territories as worthless—without a thorough investigation of their potentialities.

Just as at Heard and Macquarie Islands, immediate prizes will be accumulation of scientific data—weather forecasting, studies of magnetism, cosmic rays, aurora, gravity, upper air characteristics, radio wave propagation, biology of land, sea and ice and tidal behaviors. All a very complex scientific programme in any country.

Ultimately, payable minerals may be located. Past geological surveys in Antarctica have indicated uranium-promising strata, gold, silver, copper, iron, lead, tin and coal. Unlike the north-

(Continued on page 56)

One of the keenest of all VK1's, Rob Gurr, VK1RG (now signing VK5RG) is shown here sending commercial traffic from Macquarie Island. Rob erected a Lazy H about 70 feet high and secured remarkable results considering the poor conditions.

Commentaries

A Department of Constructive Suggestions

How To Construct A Multi-Band Antenna

No graphs and no theory, but an antenna that *works* on 80, 40, 20 and 10 meters. I have often wondered why someone doesn't publish a handbook with antenna dimensions worked out. Most of the fellows want to put up an antenna without plowing through a lot of formulas and graphs.

Here is an antenna worked out by W5LFM* so that it can be fed on 80, 40, 20 and 10 meters with the 300-ohm point for the feeder at the same place for all bands. This lends itself to the use of 300 ohm twin lead.

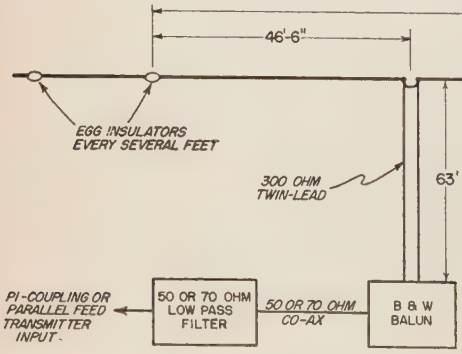
On 80 meters, the half-wave antenna has a high angle of radiation. This is good, as many readers are interested in 200-300 mile contacts. On 40, 20 and 10 meters the angle decreases and comes out about right for DX on each band.

This antenna is a version of the old single wire off-center fed Hertz. It is fed with 300-ohm twin-lead. The antenna must be cut as shown, 137 feet and 8 inches long. The antenna is fed at a point 46 feet and 6 inches from one end. An insulator is inserted and the 300-ohm twin-lead fastened and taped with electrical plastic tape. The antenna is made 137.7 feet specifically so that it falls in the middle of the ten-meter band at about 28.4 Mc., which is the most critical band. It is very broad tuning on all other bands.

There are several ways to couple the antenna into the transmitter. If a parallel tank is used, adjustment can be made by simply moving the link in and out. If a 50 or 70-ohm low-pass filter is used it will be necessary to add a set up *B&W* Balun coils to match to the 300-ohm line

* Graf, "A Multi-Band, Constant Impedance Antenna," **Radio and Television News**, Sept., 1953, p. 72.

FREQUENCY (KCS)	FINAL DIAL	MIN. & MAX.	FINE DIAL
3,600*	11.5	1	0
3,650	12	2	0
3,700	12.5	3	0
3,750	12.5	4	0
3,800	13	4	20
3,850	13	5	0
3,900	13	5	36
3,950	13	5	68
4,000	16	5	68
7,000	53	1	0
7,050	53	1	0
7,100	52.5	2	0
7,150	52.5	2	10
7,200	52.5	3	0
7,250	52.5	3	16
7,300	52.5	3	54
14,000	76	5	84
14,025	76	5	84
14,050	76	5	84
14,100	75	6	0
14,150	75	6	0
14,200	75	6	0
14,250	76	6	10
14,300	76	6	20
14,350	76	6	20
28,000	93	4	0
28,100	93	4	0
28,200	93	4	0
28,300	93.5	4	0
28,400	94	4	0
28,500	94	4	0
28,600	94	4	0
28,700	94	4	12
28,800	94	4	32
28,900	94	4	40
29,000	95	4	30
29,100	95	4	24
29,200	95	4	24
29,300	95	4	28
29,400	95	4	30
29,500	95	4	38
29,600	95	4	44
29,700	95	4	48



The antenna described in this short article originally appeared in RADIO & TELEVISION NEWS. It is a version of the off-center fed Hertz using 300-ohm line. By following the dimensions shown in the above drawing the antenna will load on 80, 40, 20 and 10 meters. Table I (above) shows the dial readings that are to be expected when using the antenna in conjunction with a VIKING II transmitter. Dial settings are for a current input of 200 ma. (Below 3600 kc. the current input is over 200 ma.)

as shown in *Fig. 1*. This system works fine with the *Viking* and *Collins* transmitters, and no antenna tuner is necessary.

I have found that with this antenna there is less TVI than when using end-fed Zepps where there is a large circulating current in the feeders.

Near the ocean it is best to use #12 plastic house wire for the antenna. This solves antenna wire corrosion problems. The antenna will last much longer than when using enameled covered wires.

Table 1 shows experimental settings, using a *Viking II* transmitter as a source. This shows how the loading dials (minimum, maximum and fine adjustments) vary with frequency change. These settings will change if the feeder length is other than 63 feet. This will give the constructor using a *Viking* an approximate dial setting during the initial test.

Do not use rope to support the antenna or you will wake up some morning and find the twin-lead wrapped around the antenna due to the shrinkage of the rope. A swivel does not help very much. It is best to use wire to support the antenna and bring the wire right up to the pulley. The supporting wires should be broken every several feet with egg insulators so as not to unbalance the antenna.

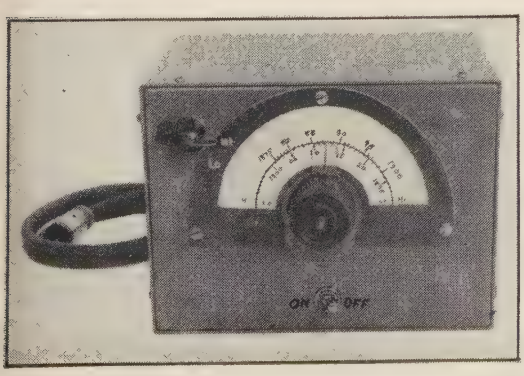
Edmund H. Marriner, W6BLZ

160 Meter VFO

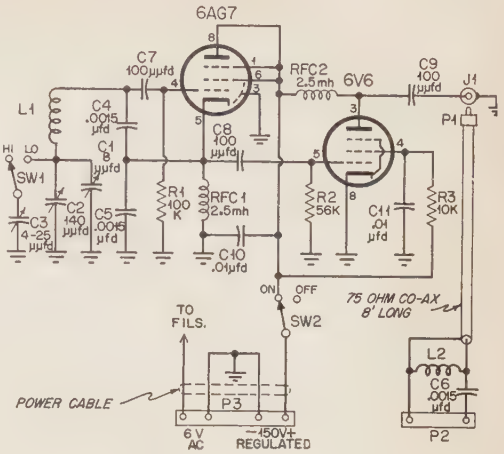
Conventional VFO's covering 160 meters tune a minimum frequency range of 1750 to 2000 kc., to cover harmonically-related frequencies in other bands. Thus, the two 25-kc. segments of the band assigned for amateur use in the eastern and western halves of the United States* are each compressed into a few divisions of the dial.

The v.f.o. herein described, designed especially for 160-meter transmitters, spreads each band segment over two-thirds of the dial. Its other virtues are simplicity, low cost (I dug most of the parts out of my "junk box"), and stability.

* East of the Mississippi, 1800-1825 Kc. and 1875-1900 Kc. West of the Mississippi, 1900-1925 Kc. and 1975-2000 Kc.



Front panel view of the W4TSM v.f.o.



C1—Two-plate, midget variable condenser, (approx. 8 μμfd.).
C2—140-μμfd., APC type air padding condenser.
C3—4.5 to 25 μμfd., ceramic padding condenser, zero temp. coeff.
C4, C5, C6—.0015-μfd., "silver mica" preferred.
C7, C8, C9—100 μfd., mica.
C10, C11—.01 μfd., mica or disc ceramic.
L1, L2—See coil table.
R1—100K, ½w.
R2—56K ½w.
R3—10K, 1w.
RFC1, RFC2—2.5-mh., r-f chokes.
Sw1—Single-pole, two-position, ceramic wafer switch.
Sw2—SPST toggle switch.
J1—Output jack, coaxial type.
P1—Plug to fit J1.
P2—Plug to fit crystal socket of transmitter.
P3—Four-terminal power plug.

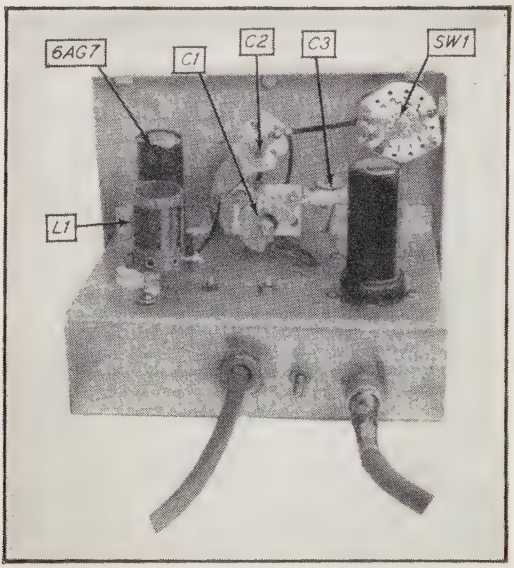
Circuit schematic and parts list.

The pictures and the diagram tell most of the story. A 6AG7 Clapp oscillator is cathode coupled to a fixed-tuned, 6V6 amplifier. I housed the unit in a 4x5x6-inch metal box that had previously contained an electric timer, bending a 1½-inch deep chassis to fit it. However, commercial "utility" boxes of the same dimensions with chassis attached to the panel are available *(ICA-3821, etc.)*. The dial mechanism came from the junk box, but is similar to the *National MCN* midget vernier dial.

The major precaution required in building a unit of this type is that of mounting all parts firmly and using stiff conductors in wiring, thus insuring good mechanical stability. *C1*, the main tuning condenser, is a 15-μμfd. midget variable cut down to two plates, while *C2* is a 140-μμfd. midget variable. It is supported by one of the screws of the dial mechanism. *C3*, the low-band segment padder, is positioned between *C1* and *Sw1*, which is mounted in the upper left-hand corner of the panel. It is adjustable with a screwdriver through a hole in the top of the case.

Coil Specifications

1800-1825 kc. and 1875-2000 kc.
L1—68 turns #28 enam., close wound on 1" form.
L2—71 turns #28 enam., close wound on ⅝" form*,
1900-1925 kc. and 1975-2000 kc.
L1—65 turns #28 enam., close wound on 1" form.
L2—68 turns #28 enam., close wound on ⅝" form*.
* Exact number of turns dependent on length and capacity of coupling cable. See text.



This rear chassis view shows the location of some of the more important components in the v.f.o.

The output coil, *L2,* is at the end of the eight-foot piece of 75-ohm coaxial cable used to couple the v.f.o. to the transmitter. It is resonated to the center of the desired frequency range by the capacity of the cable. Different lengths of cable may be used, but this will require varying the number of turns in the coil to achieve resonance, which is easily done with the aid of a grid-dip meter. My transmitter uses a tube socket as a crystal socket, therefore I mounted *L2* and *C6* in an old tube base.

Power requirements for the v.f.o. are modest, 6.3 volts at one ampere, and 150 volts regulated d.c., at a couple of milliamperes.

Calibration

After the v.f.o. is constructed and operable, place it inside the cabinet and allow it to warm up about half an hour before calibrating. The output cable should preferably be plugged into the crystal socket of the transmitter.

Set the dial pointer to the center of the scale and *Sw1* to the "High" position (*C3* out of the circuit). Then, with a calibrated frequency meter or receiver tuned to the center of the high-frequency segment assigned in your area, adjust *C2* for zero beat between the v.f.o. and the calibrator. Next, turn *Sw1* to the "Low" position and adjust *C3* to center the low-frequency segment of the band on the dial. Finally, calibrate the dial in the conventional manner. If the calibration changes with aging of the equipment or replacement of the tubes, it is easy to prepare a new calibration.

Excitation to the transmitter may be varied by changing the capacity of *C6,* which may be made a ceramic trimmer condenser, if desired.

Jack A. Offins, W4TSM

A V.F.O. for Only a Few Cents

The BC-746 tuning unit is still available on the war surplus market for only a few cents (without crystals). This item was originally used as a plug-in crystal calibrator and final tank circuit in the "Horsie-Talkie" transceiver. They are available in several different ranges and in accordance with the suggestion offered by W3JPD, a v.f.o. has been built from a "Channel 10" or 3735-kc. unit.

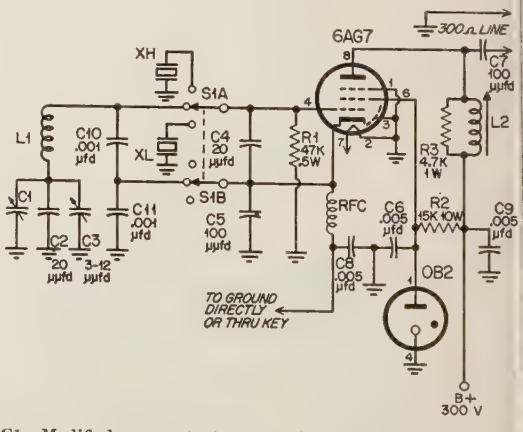
What BC-746 Components Are Used

The large coil on the polystyrene form is used as the grid coil *(L1)* in the new circuit. The small slug-tuned coil is used as the plate peaking coil *(L2).* The builder can insert calibrating crystals in the dual crystal socket at 3500 and 4000 kc. or other points throughout the dial. These are selected with the aid of *S1.*

To prepare the tuning unit for use as a v.f.o. first remove all the wires from the lugs of the 140 $\mu\mu$fd. tuning condenser, dual crystal socket and two coils. Drill out the rivets holding the phenolic jack strip and discard. Remove the protective cover over the variable condenser and pull out plates until only 3 rotor and 2 stator plates are remaining.

The wiring of the circuit is straightforward and probably needs no additional comment. The power requirements for the v.f.o. are 300 volts at about 30 ma. and 6.3 volts at 0.3 amp.

The v.f.o. is built on a 5"x7" aluminum panel which is enclosed finally in a 5"x7"x3" aluminum inverted chassis. Four holes are drilled in the chassis; two of them are ½" in diameter and the other two are ¼" in diameter. The larger holes have ⅜" ID rubber grommets in-



C1—Modified as per text.
C2—20 $\mu\mu$fd., silver mica.
C3—3-12 $\mu\mu$fd., ceramic trimmer.
C4—20 $\mu\mu$fd., silver mica.
C5, C7—100 $\mu\mu$fd., silver mica.
C6, C8, C9—0.005 μfd., disc ceramic.
C10, C11—0.001 μfd., silver mica.
L1—from BC-746.
L2—from BC-746.
R1—47,000 ohms, ½w.
R2—15,000 ohms, 10w.
R3—4700 ohms, 1w.
RFC—500 μh.
S1—Double-pole, 3-throw switch (optional).

Wiring schematic and parts list.

The completed v.f.o. is shown above with an original BC-746 tuning unit diassembled in the foreground.

serted and are used for the power cable and 300-ohm output lead. The smaller holes are drilled opposite *L2* and *C3*. This will enable final adjustment of the v.f.o. without opening up the panel.

The tubes are mounted on a small L-shaped subchassis which is about 4"x1¾". It is attached to the panel as shown in the photographs. Bleeder resistor *R2* is bolted to the L-chassis adjacent to the OB2 regulator tube.

Solder a 1½" length of ¼" round shafting to the short shaft of *C1* so that a knob may be attached. A reduction drive may be also as shown in accompanying photographs by spacing the bracket away from the panel.

Cement a sheet of thin white cardboard to the front panel and calibrate it for the bands you will be using. Make a celluloid dial pointer and attach it to the tuning knob if it does not already have one.

Apply power and the v.f.o. should take off. Adjust *L2* for maximum grid drive. The unit can be keyed by connecting the lead from the cathode of the 6AG7 to ground through the key; otherwise it is grounded within the chassis. If there is some drift it may become necessary to ventilate the chassis.

I. Pickell, W3PPQ

A Fishpole Vertical Antenna

Upon moving into our new apartment, I installed a forty-meter transmitting antenna by tying one end to a telephone pole across the alley and the other end to my *Harvey-Wells TBS-50D*. It worked fine until an irate neighbor complained to the telephone company about "the dangerous electric wire" over her garage.

Restricted to my own lot, I tried a *T2FD*, a doublet bent into an inverted "V," a folded-folded dipole, and a ¼-wave wire threaded among the power and telephone wires and other impedimenta in the back yard. They only proved that I had a good ground, because that's where all my r.f. went. It certainly never got out of the back yard!

Apparently, my only hope was a vertical antenna, but being on the second floor complicated the problem, and I had no room for ground-plane radials. I could see no practical solution until, one day, I spotted an 18-foot bamboo fishing pole leaning against the front of a sporting goods store. In exchange for $1.18, I obtained the pole and 300 feet of #22 solid copper trolling wire. I departed via the alley, followed by cries of "must be some fish."

Designing The Antenna

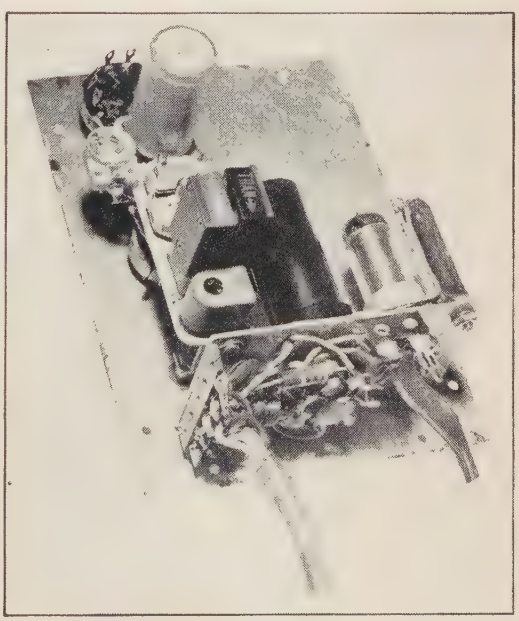
Arriving home, I immediately called upon W2USV for aid. He soon arrived with his grid-dip meter and several bottles of antenna oil, which is considered very useful in antenna construction.*

After abstruse calculations, we decided to wind 130 feet of wire on the pole to start.** And instead of evenly spacing the turns, we would use wide spacing at each end of the winding and use close spacing in the center.

With an 18-foot pole about 1¼ inches in diameter at the base and tapering to about 3/16 inches at the tip, the average length of

* Especially if refined from a malt base—**Editor.**

** Most constructors find that it usually takes about twice as much wire wound in an elongated helix to achieve resonance at a given frequency as it does with a straight length of wire—**Editor.**

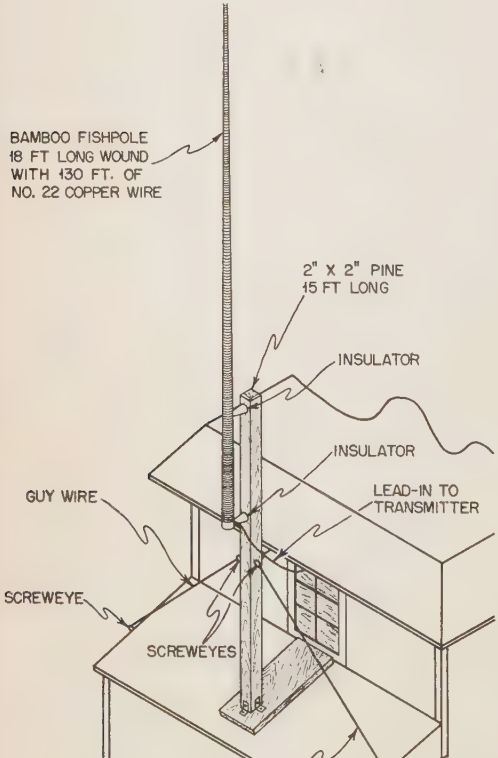


Placement view of the BC-746 conversion.

wire in a turn would be approximately two inches; therefore, it would require approximately 780 turns for 130 feet of wire. We would wind 260 turns with a spacing of ⅜-inch between turns (eight feet), 260 turns with slightly less than ⅛-inch between turns (two feet), and use up the rest of the wire in turns spaced ⅜-inch on the remaining eight feet of the pole.

Winding The Antenna

The XYL objected to us doing the winding in the house on the ridiculous grounds that we might knock down some of her bric-a-brac, but upon coercion she withdrew her objections. W2USV and I measured off 130 feet of wire from the roll, drilled a couple of very small holes through the pole near each end to anchor the ends of the wire, and began the tedious winding process. Although we were unable to retain uniform spacing between turns at the joints in the pole, our calculations were close enough, because the finished winding occupied the entire pole, with only a few inches to spare.



Installation drawing of the "fishpole" antenna as placed by W2EUQ on the back of his house.

Bringing the grid-dip meter into play re vealed that the resonant frequency of th finished winding was 6.6 Mc. Soldering jumper across several of the close-spaced cente turns moved it to 7.2 Mc. Then came the crucial test.

We connected the bottom of the winding to the antenna post of the *TBS-50D*. Wonder o wonders! It tuned and loaded very well over the entire 7-Mc. band. In addition, a neon bulb glowed brightly when touched to either end of the winding and gradually went out as it was brought towards the center, indicating that the current and voltage distribution was about what we wanted.

The assembly was then given several coats of spar varnish, allowing each coat to dry thoroughly before the next one was applied.

Mounting The Antenna

The drawing shows clearly how the antenna is installed. I mounted two standoff insulators a short distance apart at one end of a fifteen-foot length of "2x2." Then I fastened the bamboo pole to them by means of two metal straps. Hoisting the assembly to the roof of the back porch, I rested the bottom of the "2x2" on a piece of scrap lumber and fastened them together with a couple of metal angles.

A piece of guy wire, terminated in eyelets screwed into the "2x2" and the side of the house just below the roof overhang, holds the assembly upright against the edge of the roof, and a guy wire to each side of the porch prevents side motion. The "2x2" and the base are both painted white for appearances sake as well as to preserve the wood.

By utilizing some of the many fittings available for mounting TV antennas, different mounting arrangements can be devised, as required by individual installations.

A single wire drops from the bottom of the antenna and in through the window to the transmitter. This wire becomes part of the antenna. For best results, the number of active turns in the helix should be adjusted with the aid of a grid-dip meter after the antenna is mounted and the wire is in place, but before it is connected to the transmitter.

Results

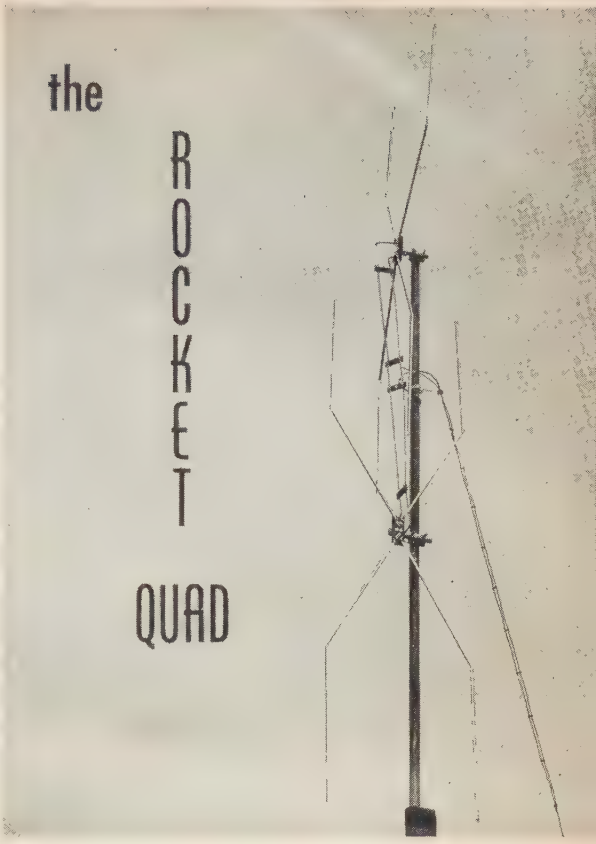
I use the antenna both for transmitting and receiving. Even under crowded band conditions, I worked my share of stations with forty watts input. My poorest report so far has been *S6*, and my best one was 20 db. over *S9* at a distance of several hundred miles.

The antenna is apparently non-directional and is especially good for working mobiles. It loads well on 14 and 28 Mc., and I suppose it would work on 3.5 Mc., with the addition of a suitable loading coil.

James Gray, W2EUQ

(Continued on page 56)

Developing a New Two-Meter Vertically Polarized Radiator



DR. ARNOLD ROSS, W2NGA

1770 Montgomery Ave., Bronx, N.Y.

I must confess to being a member of the ıternity devoted to the use of vertical polariza-ɔn on 144-Mc. I also believe there should be nsiderable interest in omni-directional verti-l antennas for CD, CAP, mobile net control d Novice stations in our big northeastern and uthern Californian cities. For many of these cations a beam will simply not work as con-niently as a good vertical radiator that ex-ɔits gain in the horizontal pattern.

The two-meter band is fairly wide. This lls for an antenna design that will not create ɔ large a mismatch as we operate from one d of the band to the other. Even though it is vertically polarized non-directional radiator should have some effective gain. Taking all ese factors into consideration I have devel-ed a vertical antenna which has been called e "Quadrapole" because it physically appears to have four elements but yet remains a simple dipole.

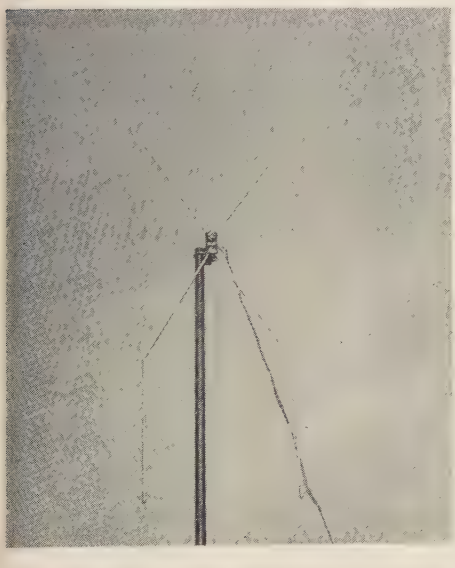
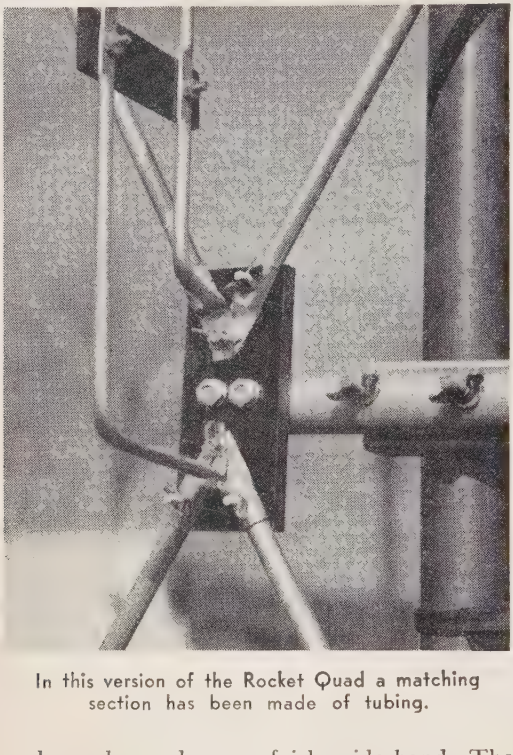


Fig. 1. The basic "Quadrapole" consists of four rods that are 40 inches in length. The separation of the "horns" of each dipole is 20 inches and the bend occurs at a distance of 20 inches from the apex. A one inch separation spaces the dipole elements at the apex. This antenna is fed with 300-ohm lead. Possibly to secure optimum results the feedline should be taken off at a right angle to the plane of the dipole for a distance of about 20 inches. This would prevent an unbalanced line.

The basic *Quadrapole* is broad-banded with a conservative 3 db. gain. Its design may be regarded as an adaptation of the conical dipole, except that the outer ends of the elements are bent parallel to each other. A photograph of the antenna is shown in *Fig. 1.*

Subdividing each part of the dipole, hence increasing the width of element, has several distinct advantages. The overall *Q* of the radiator is reduced and a good match can be secured to a 300-ohm twin-lead feedline.* This means that the *Quadrapole* has a good VSWR

* From a purely theoretical viewpoint this now becomes a "dispersed" antenna which might improve communication effectiveness. This would be particularly true in an area with a great number of vertical-plane reflecting surfaces that set up standing-wave-in-space patterns. This dipole in having a finite width would wash out deep nulls. Such nulls pronouncedly affect single-wire vertical radiators since conceivably they might lie in the null zone. In addition there is probably some horizontally polarized pickup.—**Editor.**



In this version of the Rocket Quad a matching section has been made of tubing.

and may be used over a fairly wide band. The gain of the *Quadrapole* is due to the additional length in each half of the dipole elements.

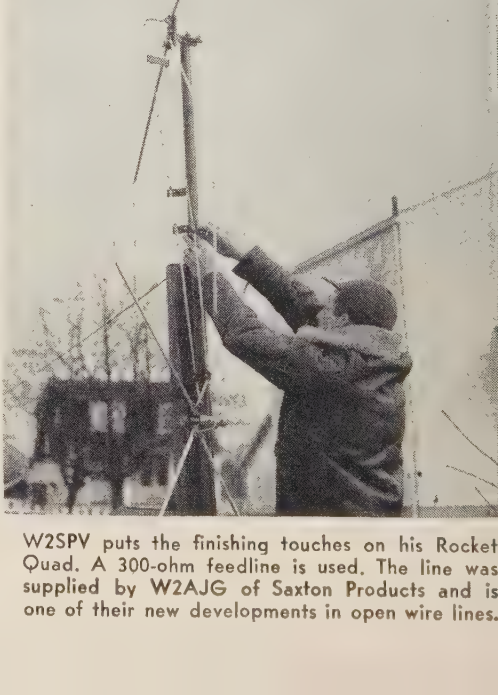
The first 144-Mc. operator to check out a *Quadrapole* was Harold Lang, W2BTA, at Syosset, Long Island, N.Y. He fed it directly with 300-ohm twin-lead and measured a VSWR of 1.2:1 which made the *Quadrapole* look like 250 ohms to the feedline. W2BTA then constructed a balun[1] and fed the radiator with RG-8/U 53-ohm coaxial cable. This resulted in a VSWR of lower than 1.1:1. Several weeks later the same antenna was constructed by Frank Lester, W2AMJ. At his QTH a VSWR of 1.2:1 was measured using the same balun and co-ax line combination. This value of mismatch would result in only about 0.15 db. loss which may be considered negligible.

To obtain higher gain, it was proposed that two quadrapoles might be stacked vertically. Several physical arrangements were tried and eventually resulted in the model shown in the accompanying photograph. The two *Quadrapoles* are mounted one above the other at a compromise spacing of 0.65 wavelength. The planes of the two *Quadrapoles* are oriented at right angles. This configuration has been nicknamed the "Rocket Quad."

Although the gain of the array is increased by this stacking it is not quite up to the theoretical maximum of 3 db. Field strength measurements did show that the *Rocket Quad* somewhat less directional (horizontal patte than the simple *Quadrapole*. Significar these tests were made with the antennas mo ed on a bamboo pole; later tests with a m pole showed the patterns slightly affected.

The spacing between the dipoles in *Rocket Quad* is selected in order to provid suitable matching section. On all bands i made of #14 wire with a 2" spacing. It m be emphasized that the *Rocket Quad* must fed at the center of the phasing harness and feedline should be brought out at least o quarter wave away from the axis of the ar The VSWR of the *Rocket Quad* fed with co-ax and balun arrangement mentioned ab should measure less than 1.5:1. Those c structors desiring a closer match might find advisable to experiment with the spacing tween dipoles and the physical dimensions the phasing section.

In summary, the *Quadrapole* and the *Roc Quad* are omni-directional antennas featur measurable gain over that of the ground pl and coaxial antennas commonly used at th frequencies. The mechanical design is rema ably simple and need not be cut and pruned l the coaxial to secure a good match. A Ta listing the dimensions for the three import v.h.f. bands is shown. In some locations it n demonstrate remarkable anti-fading charact istics due to the "width" of each dipole eleme



W2SPV puts the finishing touches on his Rocket Quad. A 300-ohm feedline is used. The line was supplied by W2AJG of Saxton Products and is one of their new developments in open wire lines.

1. Smith. "Balun—Theory and Design," CQ, Feb., 1952, p. 24.

Low-Pass Filter for CW Reception

JOHN ALTHOUSE, W5VRP

4938 Burton Ave., S.E., Abuquerque, N. M.

If You Want to Reduce High Frequency Audio Beats and Noise Components This Filter is The Answer.

One of the least used of the many schemes presented in past years for the reduction of interference in receiving is the low-pass filter. This device, connected somewhere in the audio system of a receiver, rejects all frequencies above some "cut-off" frequency while passing all lower frequencies with little attenuation. It is particularly suited to C-W reception where all beat-notes above the cut-off frequency may be eliminated.

It is the purpose of this article to suggest that neither of these considerations need preclude the addition of a low-pass filter to the average receiver.

A crystal filter, which can take a 20-cycle slice out of the 10-kc. pass-band of a "high-fidelity" receiver, can do wonders on today's crowded bands. Its use, however, imposes certain conditions on the balance of the equipment and upon the operator. Both transmitter and receiver must be stable. This means freedom from drift and, for the transmitter, absence of chirp. This criterion is not often met in the inexpensive receiver nor by a great many VFO's. It might be added that a certain amount of skill is required to operate such a selective receiver.

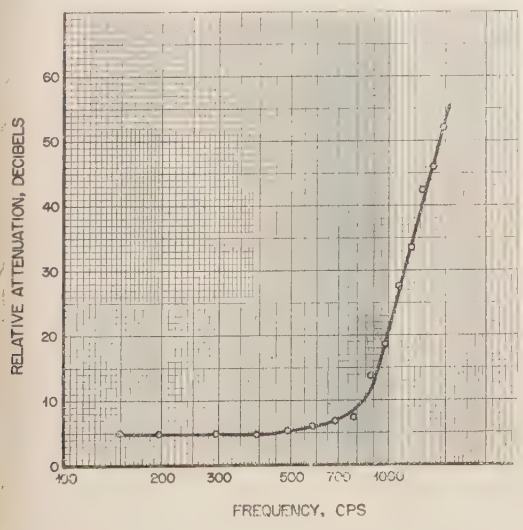


Fig. 1. This curve shows the performance of one of the low-pass filters constructed by the author.

How Much Improvement?

Suppose for the moment that we could be satisfied, during a portion of our operating time at least, with something less than the interference reducing properties of a crystal filter—say a five or ten to one improvement—provided that we need not worry about receiver drift or sharp tuning. This is approximately the improvement that can be realized with a low-pass

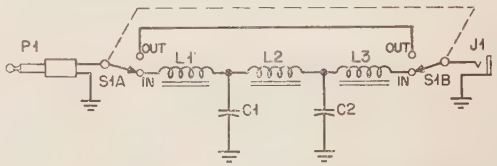
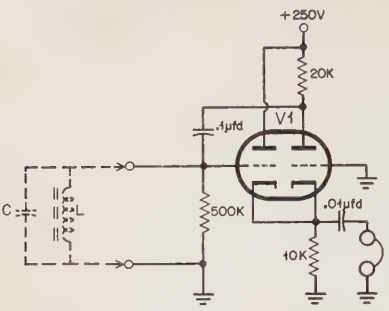


Fig. 2. Wiring of the audio filter.

filter. Its pass-band is usually made on the order of 1000 c.p.s., reducing the response of the receiver to that amount from its original 5 to 10 kc. bandwidth. This is accomplished without changing the normal characteristics of the receiver other than to quiet it somewhat. The ringing often associated with peaked filters is notably absent and beat-notes will not drift out of the pass-band even though the receiver or transmitter is not entirely stable. No controls other than a switch are added.

As to cost, it is true that commercial filters and filter-components are expensive but, perfection aside, a creditable low-pass filter may be constructed from bargain-basement low-Q components. The characteristic curve of a filter utilizing a-c/d-c type filter chokes is illustrated in *Fig. 1*. The curve is by no means ideal, but the attenuation above cut-off rises rapidly enough to provide a marked improvement in reception.

The schematic of this filter appears as *Fig. 2*. Its cut-off frequency was designed to be 1000 c.p.s., and its impedance is 15,000 ohms. Match-



V1 - ANY DUAL TRIODE AS: 6SN7, 6SL7, 12AU7, ETC.
C - .002 TO .02 μfd, (SEE TEXT)
L - CHOKE, (SEE TEXT)

Fig. 3. The test oscillator which is used to provide a means of matching the filter components.

ing this impedance does not appear to be of particular importance—the filter has been used interstage and directly in the receiver output between the phone jack and the headphones. The double-pole switch allows the filter to be cut in or out at will.

Obtaining Matched Components

The principal problem encountered in constructing a low-pass filter is that of obtaining matched components. The absolute value of *L* or *C* is of secondary importance since a few tens of cycles variation one way or the other from the desired cut-off frequency is of little interest in this application. It is important, however, that the *relative* values of the components be exact. That is, *C1* should have the same capacity as *C2*, *L1* should have the same value as *L3* and half that of *L2* as closely as possible. This determines the effectiveness of the filter.

Power supply chokes of the same nameplate value are rarely enough alike in inductance to meet the requirements of this application. Fortunately, it is a simple matter to measure the relative inductance of a number of chokes and select those that are most nearly equal. If the junk box will not suffice, one of the simplest and least costly ways to obtain the required inductors is to purchase a quantity of "bargain" filter chokes. From ten such chokes, five may be selected that are nearly equal in inductance and these used to form the filter. Advantage may be taken of the 2:1 ratio of the required inductance values to combine identical chokes in series or parallel combinations. The filter of *Fig. 2* comprises five 5-henry chokes. Two in parallel form *L1* and *L3*.

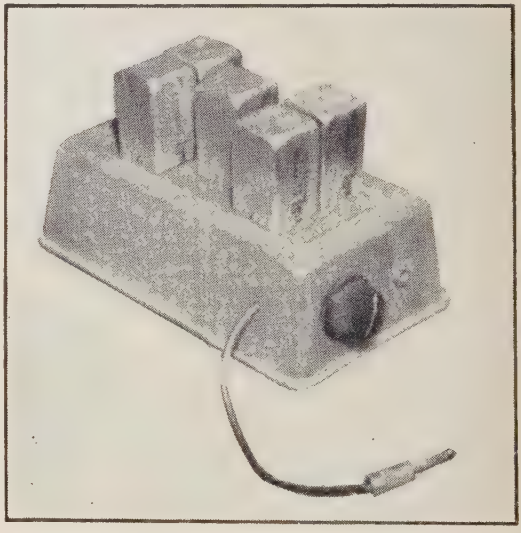
Another obvious combination is the use of 2.5-henry chokes. Two in series then form *L2*. Other values of inductance may be used by changing the capacity of *C1* and *C2* according to the following formulae:

$$L2 = Z/\pi f, \qquad C1 = 1/\pi f Z$$
$$L1 = L3 = \tfrac{1}{2}L2, \qquad C1 = C3$$

where *Z* is the filter impedance and *f* is the cut-off frequency.

The oscillator of *Fig. 3* provides a simple means of matching components. The chokes available are connected in turn to the oscillator and those selected for the filter which produce most nearly the same tone in the phones. The condenser used in parallel with the chokes for this test may be of any value that will give an audible tone; one of those to be used later in the filter will do. The same condenser should be used for all tests, of course. *C1* and *C2* may be matched in the same manner.

Although mica condensers will be found to be quite close to their rated capacities, the values marked on paper and ceramic types are often only guaranteed minimums. The actual capacity may be considerably larger and it is therefore wise to make some check at this point to make certain that the cut-off frequency of the filter will not be too low. The oscillator of *Fig. 3* is called into service again for this purpose. If *L1* is paralleled with a capacity composed of *C1* and *C2* in series and this used as the oscillator tuned-circuit, the tone produced will be that of the cut-off frequency that will be obtained in the filter.



A five by eight inch cakepan serves as the chassis for the audio low-pass filter unit constructed by the author.

Wiring of the filter is simple and not critical as to lead length or component placement. Shielding is not required since operation is at headphone audio level. A small cakepan of the type prevalent in kitchens was used as the chassis for the filter pictured here. A shielded lead with plug to fit the receiver phone jack is shown although an open two-wire lead will do as well. The phone jack and "in-out" switch have been placed on the front panel.

Unless a considerable mismatch occurs between the receiver output and the filter, little, if any, attenuation of signals in the range below

(Continued on page 55)

Test Equipment..... ... in the Ham Shack

HOWARD BURGESS, W5WGF

925 Adams St., S.E., Albuquerque, New Mexico

(Part IV of this Series)

Oscilloscopes

The modern oscilloscope, in its various forms, is one of the most useful and indispensable pieces of test equipment in present-day communications and electronic work. Even the most simple 'scope is far superior to the things used in the early Ham shacks. Some of the first diabolical contraptions were weird and temperamental, using rotating mirrors, neon bulbs and silk thread drive belts.

Although they had become more or less common, 'scopes remained relatively crude until the early 1940's when research in military devices gave them a terrific boost. At the close of the war the flood of surplus hit the market and some fellows found 'scopes which were usable. Others mailed in their $9.95 and then paid the freight bill of $22.50 after a cast iron dog-house had been dumped in the front yard. After rounding up a few friends in the house-moving business the purchaser had the unit moved to the rear of the lot, and that concluded his particular adventure with 'scopes.

It seems that almost every Ham wants a good oscilloscope. One of the things we have not been able to understand, though, is why so few are willing to attempt the construction of such an instrument. Many amateurs build all-band transmitters and double conversion superhets, but an instrument with less parts than a standard broadcast set will scare them out! Anyone

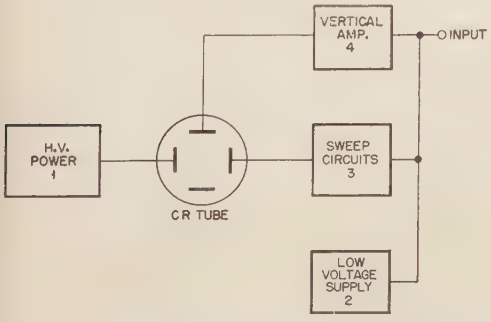
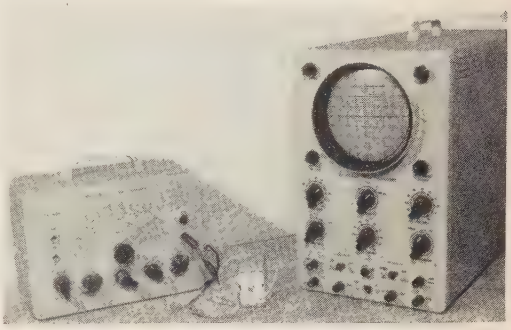


Fig. 1. Block diagram of the usual scope.



Checking out an i-f transformer with a Heathkit oscilloscope and signal generator.

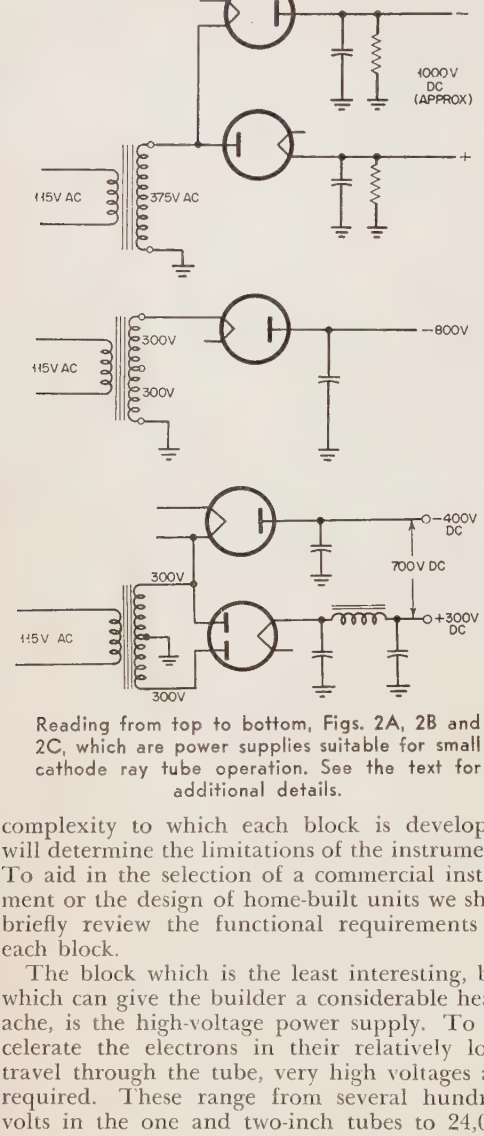
who is interested will find that even the 'scopes of above average quality have less parts and are less complicated than an ordinary single conversion superhet.

Now that we have put ourselves out on that well-known limb, suppose we attempt to show why such a valuable piece of gear can still be this simple.

How They Work

In view of the fact that many books that go into detail regarding the construction of cathode ray tubes, we'll only touch upon the subject here. It will suffice to say that the cathode and electron gun focus the beam into a small spot upon the face of the tube. The beam can be deflected vertically or horizontally by a voltage on either of two pairs of electrodes. This means that our indicating or writing mechanism consists of just an electron stream. For our purpose, we can assume electrons to be weightless, giving us an indicator without inertia. In this principle lies one of the greatest assets of the 'scope. An ordinary meter, because of the weight of the pointer, can follow no more than a few cycles per second; The beam in the tube can follow accurately at a rate of more than several hundred megacycles.

Although we now have an indicator which is capable of extreme speed, it must be combined with several basic circuits to be of use. *Figure 1* is the block diagram of an ordinary 'scope; the



Reading from top to bottom, Figs. 2A, 2B and 2C, which are power supplies suitable for small cathode ray tube operation. See the text for additional details.

complexity to which each block is developed will determine the limitations of the instrument. To aid in the selection of a commercial instrument or the design of home-built units we shall briefly review the functional requirements of each block.

The block which is the least interesting, but which can give the builder a considerable headache, is the high-voltage power supply. To accelerate the electrons in their relatively long travel through the tube, very high voltages are required. These range from several hundred volts in the one and two-inch tubes to 24,000 on some of the five-inch models. Less voltage, however, can usually be used on a tube than that shown in the data sheets. When less voltage is used, less signal is required for a given amount of deflection, which is an advantage. However, the intensity drops along with the lowered voltage, and as the sweep rate is increased beyond certain limits, the image soon becomes prohibitively dim. Therefore, the highest voltage consistent with equipment safety and economy should be used.

The High Voltage Supply

This high voltage can be furnished by an extra winding on the regular low-voltage power transformer or (because the current required is usually less than a milliampere) by the oscillator type power supply. For those unfamiliar with this latter type of supply: it is a low-powe tube, such as a 6AQ5, used as a low-frequenc (2,000-10,000 cycle) oscillator. The output wind ing of the oscillator coil has a very high turn ratio and supplies a high-voltage low-curren rectifier. Because of the turns ratio, very hig voltage can be had and because of the high fre quency very little filtering is needed. In thi method the a-c line power transformer nee furnish only low voltage (250-300 volts).

For the small tubes, such as the two- an three-inch variety, power supplies as show in *Fig. 2* may be used. The method in *Fig. 2A* is economical, but the deflection plates of th tube must be fed through blocking capacitors The transformer in *Fig. 2B* can be any low current power transformer. The output voltag will be about 1.4 times the end-to-end voltag of the secondary. *Figure 2C* is one which ma prove useful, considering all of the odd trans formers which may usually be found floating around Ham shacks. The high voltage will b more than twice the a-c voltage of the secondary of the transformer. In this case, too, the signa to the deflection plates must be fed through blocking capacitors. The low-voltage powe supply (block 2) is similar to any good receive supply and may be the same transformer a shown in *Fig. 2A*.

Sweep Circuitry

Number 3 in the block diagram is the swee circuit. There are a few 'scopes on the marke which do not include a sweep source. However the value of an instrument should be deter mined largely by sweeps available. The ideal sweep would be one which moved the beam across the face of the tube horizontally at a con stant rate of speed. After completing its travel in one direction it should return to the starting point in zero time. This would mean a wave form consisting of a perfect saw tooth being ap plied to the horizontal deflection plates.

Perfect waveforms are hard to come by but early builders found that fair results could b obtained from a gas tube in relaxation type oscillator. Because such a tube is unstable and any change in frequency will cause the pattern to move across the screen, some method must be used to hold the frequency of the sweep in step with the signal being observed. To do this a grid was inserted in the gas diode and a small amount of input signal fed to it. When this is done the sweep oscillator will lock with the input signal to hold the pattern still.

This circuit is still not good enough because the output wave is not completely linear, a characteristic which causes the pattern to bunch on the screen. To remedy this effect, a pentode can be placed in series with the high voltage supply to the oscillator. Because the plate current of a pentode can remain constant with varying voltage, the capacitors are forced to charge at a constant rate, which gives us a wave nearer a saw tooth in form. This type of

sweep has given very good service for years and is still used in many 'scopes. As faster and faster sweeps became a necessity to observe higher and higher input frequencies, another fault inherent in the gas tube became a limitation. This is the de-ionization time, or the time required for the gas glow to extinguish. This time factor varies over wide limits in different tubes. A tube stops oscillating and begins to glow continuously when the frequency approaches the de-ionization time. A tube requiring 50 microseconds to de-ionize would stop oscillating as the input frequency approached 20 kc.

This speed limitation in the sweep circuit has led to the use of "hard tube" circuits or of ordinary, non-gaseous tubes. Various circuits are being used, but the ones most widely favored at this time are versions of the multivibrator. By variation of this circuit almost any wave form, from square wave through saw tooth to pulse, can be produced. The multivibrator lends itself very well to synchronization as a free running oscillator or triggered sweep.

In the triggered type of sweep, the sweep operates only when started by a signal. In its usual operation the signal applied to the vertical deflection plates also triggers the sweep. This is perhaps the most useful of all sweeps, and can be made to operate at extremely high speeds. Oscilloscopes are made using this method of sweeping which will show the individual r-f cycles of a 200 megacycle carrier —a feature of the most expensive models.

Vertical Amplifiers

Number 4 in the block diagram is the vertical amplifier. The average cathode ray tube requires between 75 and 150 volts signal to move the beam one inch. The vertical amplifier receives the signal to be viewed and amplifies it to the amount required to give full vertical deflection. Any amount of amplification desired can be built into 'scope so that very small signals can be viewed on the full screen. However, the more amplification built into the unit, the greater becomes the problem of bandwidth or

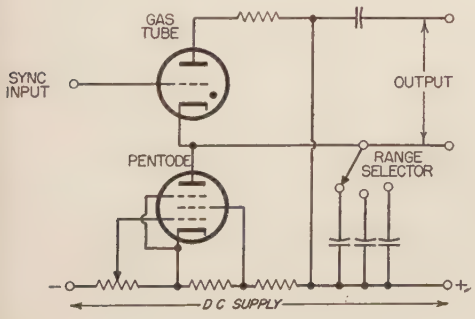


Fig. 3. This type of sweep oscillator circuit was used in many early oscilloscopes.

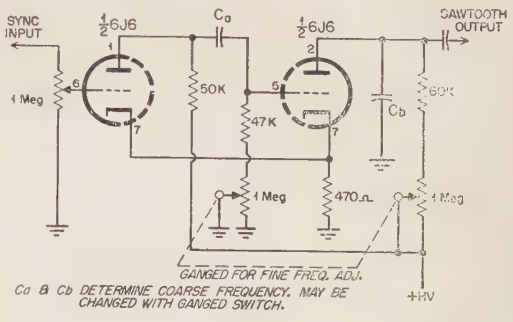


Fig. 4. Typical "hard tube" sweep generator as used in many modern oscilloscopes.

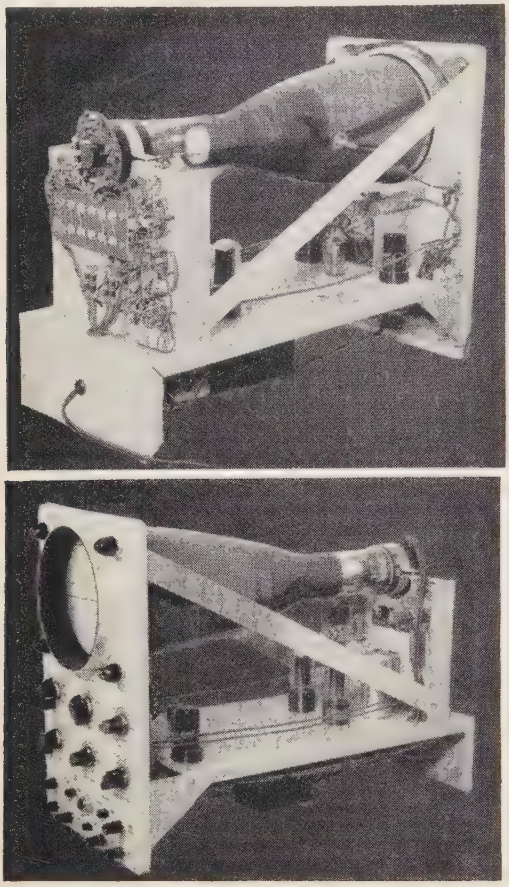
frequency response and distortion. For this reason it is best that the builder settle for the smallest practicable number of stages.

In buying or building a 'scope the frequency response of the vertical system should be given considerable thought. An instrument with response to only 20 kc. can be very valuable in the Ham shack. If it goes to several hundred kilocycles its uses are multiplied, and any Ham whose 'scope exhibits a response of several megacycles is very fortunate. For the audio man who plans on using a square wave generator in his work, the 'scope should have a frequency response of not less than 21 times the highest square wave frequency to be used. For pulse work the demands are even greater; for good reproduction of a pulse the response of the amplifier should be the reciprocal of the rise time of the pulse. A 1 kc. pulse with a rise time of 1 microsecond would require a bandwidth of 1 megacycle.

Shown in *Fig. 5* is a portion of the vertical amplifier as used in a present day 'scope. By using peaking coils, degeneration in the cathode circuits, and a certain amount of direct coupling, the frequency response is much greater than in the general run of small 'scopes.

From the discussion of the separate sections of a 'scope it may seem that we have nullified our own argument to the effect that a 'scope can be simple. A check of the medium priced models on the market brings out the fact that they use an average of six to seven tubes each. Of these, two are rectifiers and one is the cathode ray tube. This leaves three or four tubes for the vital circuitry and these are resistance coupled in most cases. This leaves us with a circuit about as simple as a ten-watt modulator or speech amplifier. We do use one tube as an oscillator; it requires no calibration or tuning.

Perhaps it seems inconsistent to sell the idea of a 'scope without telling how to build one. For those who have reached this stage there is adequate information available in almost any Ham manual. We will avoid repetition at this time, and use our space here to discuss some problems which may be encountered.



Side views of the Heathkit 'scope.

In the ordinary 'scope the deflection is electrostatic but the beam can be deflected just as easily by a magnetic field. Lest the home constructor or operator forget this, never mount a transformer of any kind near to the cathode ray tube without adequate shielding. A power transformer with strong stray fields can ruin a picture from a distance of a foot or more unless well shielded or oriented for least magnetic flux through the tube.

A large audio transformer nearby can cause severe distortion. If it is carrying the same signal as that displayed upon the 'scope considerable time may be spent trying to isolate the trouble. When the tube is inclosed in a shield care should be used never to bend or drop this special shield. Such shields are usually constructed from material of excellent shielding effectiveness, which loses this characteristic once a stress has been put on the metal.

Possible Trouble Sources

Another source of trouble which may not be readily recognized is stray pickup in the signal input system. This shows up many times as "lace" or grass modulating or riding along on the desired signal, or is characterized by the desired signal riding along on a much slower wave. The first step to prevent this trouble is that of grounding the chassis of each unit in the setup to the 'scope chassis. The next step is to shield the signal input lead to the 'scope—be sure to ground the shield. If the observed signal is of pulse or square wave type the problem becomes more difficult. Many times a shielded cable if not properly terminated will set up a peculiar condition known as ringing. This will show up as distortion of the square wave or pulse, and a termination which will completely eliminate this trouble is not easy to find. In this case a plain unshielded lead kept as short as physically possible and clear of strong power fields will be the easy way out.

For many of the measurements in Ham radio such as modulation, neutralization and other cases where the r-f carrier must be observed, the signal must be fed directly to the deflection plates. At the lower Ham bands this is simple and usually means removing some sort of a jumper and attaching the r-f leads. For those who have tried to use the ordinary cathode ray tube at very-high frequencies it is another story. The leads inside a 'scope tube are not short and at v.h.f. a considerable portion of the wavelength is in the

(Continued on page 67)

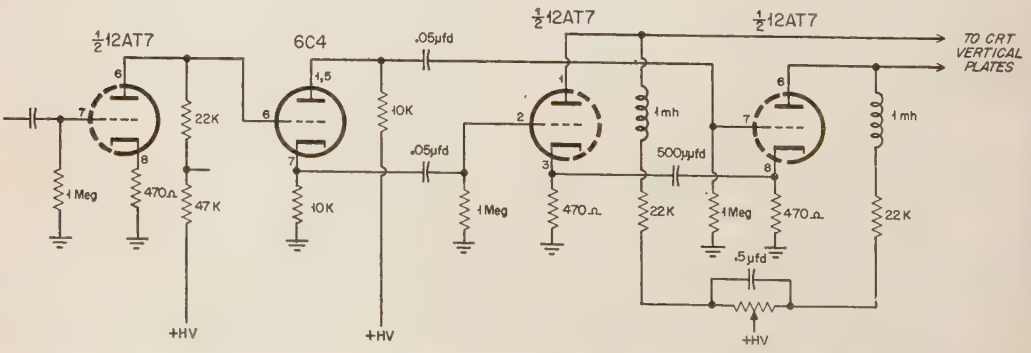


Fig. 5. This portion of a vertical amplifier circuit is typical of those in use at the present time.

The VHF-UHF News

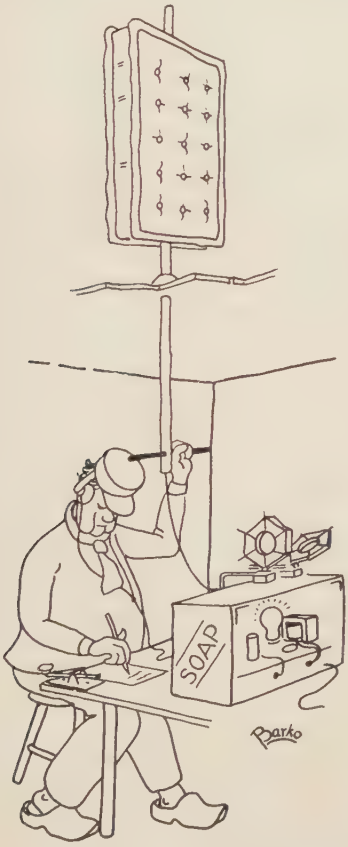
FURMAN C. COBB

c/o CQ Magazine, 67 West 44th Street, New York 36, N.Y.

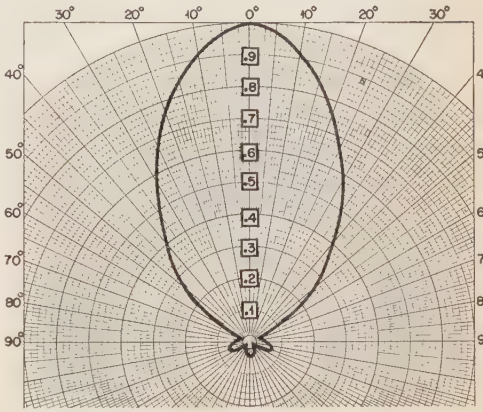
Since reactivating this column, at the request of a large number of VHF/UHF enthusiasts, we have attempted to report on 144-Mc. activities throughout the entire world. In doing so we had hoped to be able to correct a short-sighted view that we North Americans have on VHF prowess. Last month we were glad to see a number of comments from our readers indicating they have found such material informative and valuable. *Your* letters on the handling of this column will always be appreciated, too.

The PE1PL "Mattress"

Almost all of our readers in the western hemisphere will be surprised to learn that one of the most active



PE1PL as envisioned by the "uninitiated."



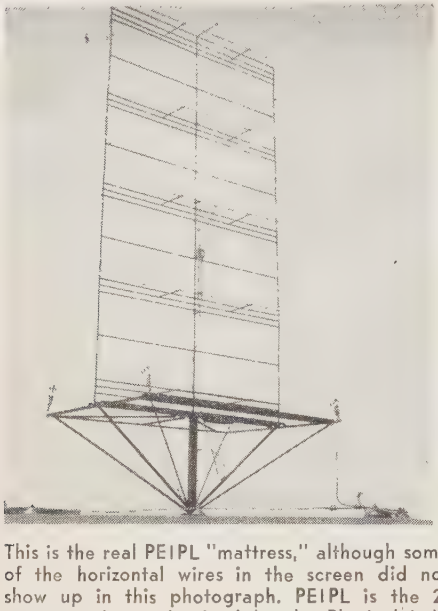
This is the measured horizontal radiation pattern of the PE1PL array. The forward gain is about 15 db. and the front-to-back ratio is of the order of 28 db.

144-Mc. stations in Europe is an experimental station sponsored by the Physical Laboratory in the Hague (Holland). It operates with an all-Ham crew in cooperation with the Netherlands Postal Telegraphy and Telephony Authorities and the Royal Netherlands Meteorological Institute. The assigned call is PE1PL, which fairly baffled many European Hams, who at first stubbornly stuck to the more usual "PA" prefix. By now however, many reports of 144 and 420 Mc. DX contain glowing accounts of this station.

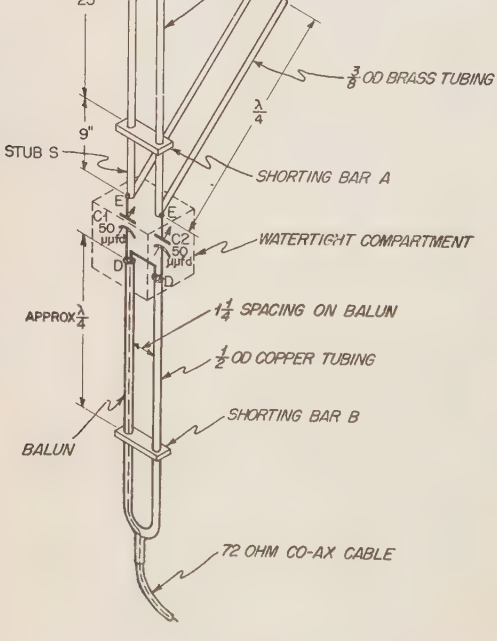
On 144 Mc. the operators at PE1PL give most of the credit for station performance to the 20-element "mattress." Fundamentally this array is a stacked collinear with a screen reflector. The ten "reflecting" elements are replaced by the screen and the ten radiating elements are arranged in two stacked rows of five each. They are fed in-phase and connected to a 72-ohm coaxial line through a balun. Additional matching is provided by the shorted stub as shown in the accompanying diagram.

Note in the diagram that the stub is adjusted by the movable bar about 9 inches above the "matching box." The latter contains two 50-$\mu\mu$fd. variables with screwdriver adjustments. The array is tuned up with the aid of a *reflectometer* with the VSWR set at the lowest possible value through variation of C1 and C2 (which should be equal) and the movable bar. The bar on the balun should remain fixed at about ¼ wavelength of the operating frequency.

The "mattress" performs very well with a pattern



This is the real PE1PL "mattress," although some of the horizontal wires in the screen did not show up in this photograph. PE1PL is the 2-meter station maintained by the Physical Laboratory in The Hague, Holland. The antenna above is a stacked co-linear array with a screen reflector, mounted on a rotating platform. Plenty of DX has been worked from this station with their super-sensitive receiver and a transmitter ending in a 4X150A.



Arrangement of the balun and matching stubs on the PE1PL "mattress" array.

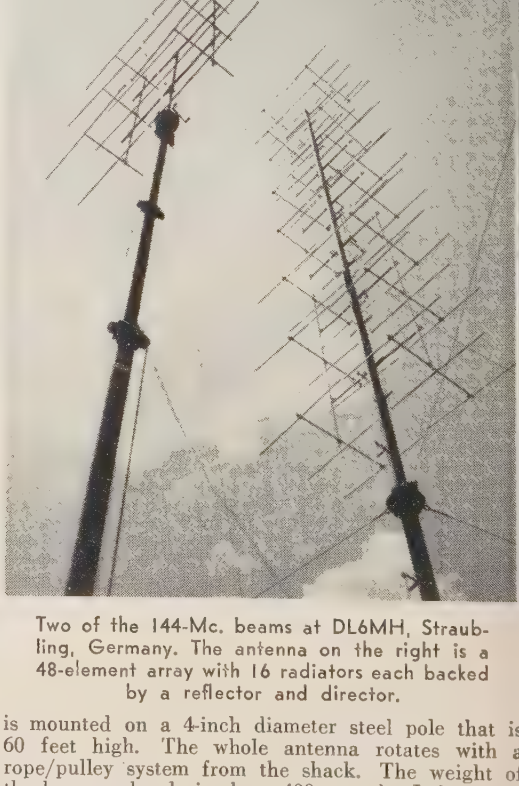
comparable to that shown in the polar diagram. Th forward gain is about 15 db. over an isotropic radiato and the front-to-back ratio of the order of 28 db.

A description of PE1PL activities would be in complete without some mention of the 144-Mc. re ceiver or quad-converter that was in use severa years ago. In its final version it contained 29 tube and was mounted in a 30" x 24" x 12" frame. I was cooled, naturally, with a blower system. Th noise figure was better than 3 (4.77 db.), th stability was better than 2 parts in a million afte warm-up, spurious responses were over 80 db. dow and the minimum detectable signal was 0.01 micro volt over a 100-ohm load, or the startling flea powe of 10^{-18} watts!!!

DX at PE1PL has not only included DL6MH mentioned below, but the regular schedules with DL3VJ/P (Monkeberg), 200 miles, which were held for over one year. Weekly schedules with DL6BU 315 miles, have indicated that fairly dependable con tacts can be made under most climatic conditions.

48 Elements at DL6MH

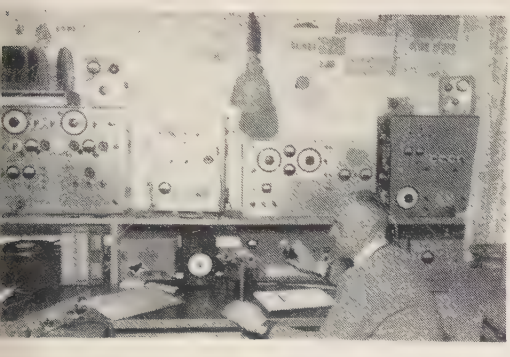
Another quite interesting 144-Mc. DX station in Europe is operated by Joseph Reitofer, DL6MH, Straubling, Germany. This station has done some outstanding work with multi-element beams. The photograph shows the latest 48-element array. It



Two of the 144-Mc. beams at DL6MH, Straubling, Germany. The antenna on the right is a 48-element array with 16 radiators each backed by a reflector and director.

is mounted on a 4-inch diameter steel pole that is 60 feet high. The whole antenna rotates with a rope/pulley system from the shack. The weight of the beam and pole is about 400 pounds. It has been carefully designed since an early 24-element array collapsed and fell through the roof.

The antenna consists of 16 driven elements in collinear pairs. These pairs are stacked eight high



DL6MH listening for the weak ones on 2-meters. The receiver combination includes a Wallman in an HRO. The transmitter is 100 watts input.

and each driven element has one reflector and director. The top and bottom four bays of the array are fed separately. An open wire feeder system is used with the configuration similar to our W3HWN beam. Each bay has, at its feedpoint, a half-wave shorted stub on to which a 300-ohm line is tapped at the proper point. The 300-ohm leads from the top and bottom arrays are connected in parallel at the center of the antenna. This is then matched to the 300-ohm feedline from the shack by a quarter-wave Q section.

DL6MH has worked PE1PL, which was described above, at a distance of some 425 miles. OK1AA has also been worked, and, although only about 135 miles away, is cut in the middle of the path by the Bayerwald rising to a height of 5000 feet. Also on the DX list are DL4CK at 195 miles, DL3JI at 198, DL6EP at 248 and DL6EF at 217. Most of the latter stations having been worked a number of times.

The Trans-Continental 2-Meter Test

Plans are gradually falling into shape for the first 2-meter relay attempt from coast to coast. A great amount of support for the idea was expressed by the TWO METER & DOWN RADIO CLUB (Los Angeles) at their January 6 meeting. May 30 was suggested as the target date, although this may seem a little early in the year to complete all the necessary arrangements.

Next month I hope to picture a map of the United States showing the proposed route. As it stands right at the moment, W6EMM would initiate the West Coast message and relay to W6AEA (Covina), then to W6WGT (Riverside), then to W6QR (Hemet) and up to Santa Rosa Mountain where the TWO METER & DOWN Club would have a mobile. This should clear California and put the message into the hands of W7LEE. Arizona might be jumped with the aid of stations in Phoenix and Tucson (W7FGG).

Letters are being dispatched to possible relay points, and if the May 30 date should prove to be too early, an attempt will probably be made during the fourth of July holiday.

Another RASO Report

The 500 members of the 1949-51 RASO 6-meter project will be interested in knowing that their observations still form an important part of the Air Force program on upper atmosphere research. Managing Editor Ferrell brings to our attention the paper presented at the 127th National Meeting of the *American Meteorological Society* on January 27th. It was delivered by N. C. Gerson, the scientist in the *Air Force Cambridge Research Center* working with the FASO 6-meter data.

The abstract from the program notes of that meeting probably gives the best summary of the current work. They state:

"Sporadic E which is located near 110 km. has been studied during the period 1949-51 inclusive, in cooperation with the radio amateurs of North America. These amateurs, operating at a radio frequency of 50 Mc., supplied basic reports from which the presence, growth, movement and dissipation of Sporadic E clouds were determined. Usually the trajectory of the moving sporadic area could be delineated. During their movement, many of these clouds grew markedly in size and on some occasions extended over an area of 1,000,000 km^2. The drift of the Sporadic E areas in the great majority of cases had an easterly component; however, in some instances westerly motions were noted. The average speeds were about 200 (plus or minus) km/hr. It is interesting to note that the average speed is almost the same as that deduced from other sources including the motions of ionospheric irregularities."

What Some of the Gang are Doing

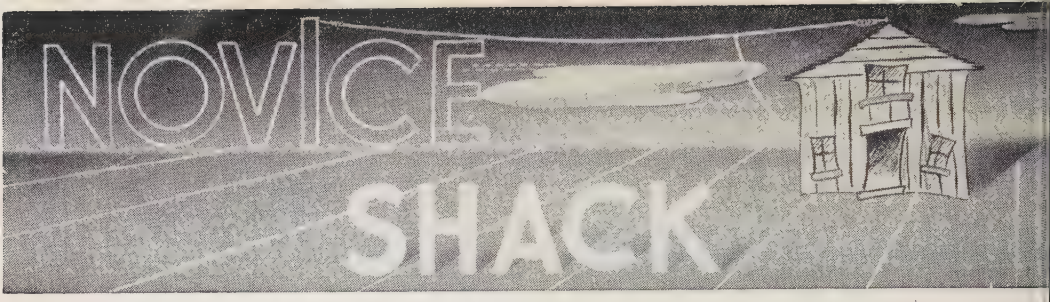
Jim Lowe, W6COH/XE2XC (Van Nuys, Calif.) sends in another interesting report on his 2-meter adventures throughout southern California. Jim says that on the afternoon of January 13, he was called out to put in some temporary microwave gear on a mountain top some 30 miles east of Johannesburg, or about 110 miles northeast of Los Angeles. After seeing that the microwave link was operating, W6COH turned his attention to the lower frequencies—namely, 144 Mc. With a ground plane atop a 2x4 strapped to the side of the truck, Jim let go with a "CQ California" and raised KN6DFH who did a grand job of alerting the band. W6HTC and W6WGT were worked, and W6QGK, W6QDY, W6JOT plus many others around Los Angeles were heard. W6QR couldn't hear W6COH, although Jim says that Gil (in Hemet over 100 miles south) boiled in with an S9 signal.

W6COH was using his faithful GONSET green-eyed monster and still wishes that someone would come along with a good 2-meter beam that he could fold up and take on these trips. Jim says for everyone to try to make the LMRE Convention next May as it will really be terrific.

Henry L. McPeak, (Trumansburg, N.Y.) brings to our attention a drafting error in the schematic of the W5MJD antenna-mounted 6-meter booster that appeared in the February column. In some mysterious way the relay connections have been interchanged to ground out the booster **and the antenna** whenever the relays are energized. Obviously the antenna "input" and "output" 300-ohm leads go to the arms of the relays. One set of contacts (when the relay is not energized) go to the booster link coils. The remaining set of contacts, when the relay is energized, by-pass the booster through the external 300-ohm lead. In the original diagram sent in by W5MJD there appears to be another set of arms on the relay which ground out the booster during "transmit." This does not seem to agree with the stated type of relay suggested by Joe and we are checking into it.

Lt. Robert Tiffany, CAP (Auburn, Me.) passes along some notes regarding the 144-Mc. transmitter described in the December 1952 issue. It was built by W2PAU and W2SPV for the Novice licenses who wanted to get on phone. Lt. Tiffany says that four of these units were built for use by the CAP on 148.14 Mc. They seemed to suffer from oscillation and overload in the speech amplifier. This was cured by changing grid resistor R13 from 1.0 meg. to 250,000 ohms. The output link coil was also modified by changing it to 3 turns and placing a 3-30 $\mu\mu$fd. trimmer in series with the ground end to tune out reactance. The units now produce an S6 signal at the top of Mt. Washington from a distance of about 70 miles.

Keep sending in those reports and comments. Next month I hope to write up the VHF/UHF activity in Argentina.



Conducted by HERB BRIER, W9EGQ

385 Johnson St., Gary 3, Ind.

Most Novices and many old timers do not feel that a first contact with another amateur is really complete until cards confirming the contact have been exchanged. These cards are called "QSL's," because their purpose is essentially the same as the internationally assigned meaning of the Q signal, QSL: "I give acknowledgment of receipt."

QSL cards or other written proof are required to obtain many of the certificates awarded by various amateur organizations in recognition of certain operating achievements. Among these are WAS (Worked All States), WAC (Worked All Continents) and many, many more.* They also serve as mementoes of pleasant and unusual contacts. Many amateur shacks are completely papered with QSL cards, while

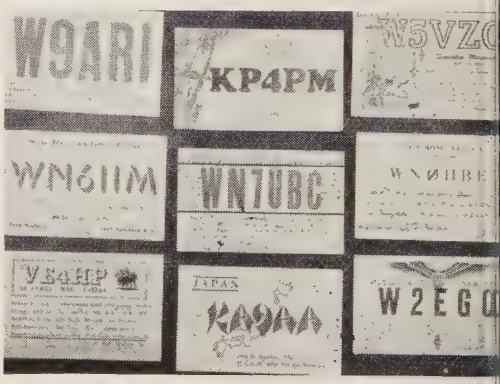
John Bagwell, WN5ZYR/4, and his Novice station located in Pearson, Ga. John gives much of the credit for getting his license to the Novice Shack.

other amateurs keep their cards in albums, scrap books, or file boxes.

On this page is a picture of a number of typical QSL cards. To be complete one should contain the following information:

1. Call letters of the sending station.
2. Its location.
3. Name and address of the operator.
4. Call letters of the station contacted.
5. Date and time of contact.
6. Frequency (band) upon which contact took place.
7. Signal report and mode of communication (CW, Phone, etc.)
8. Any additional information you wish to include.

Omitting any of these items reduces the value of a QSL card. For example, if you work the forty-eig states on the 3.7-Mc. Novice band, you can ha your WAS certificate endorsed to show this fact every card submitted as proof is clearly marked 3 Mc. or 80-meter Novice band; therefore, a card om ting this information would be useless for the pu pose. Similarly, a 145-Mc. phone operator will n be overly happy with a card confirming anoth



Typical QSL cards received by W9EGQ to confirm two-way amateur radio communication.

state, if it does not indicate that the contact w made on 145-Mc. phone.

Item 8 is wide open. Some amateurs limit the selves to a few "remarks." Others print a sh biography of their amateur career and a comple description of their stations on their QSL car They may also list the number of contacts mad number of cards sent and received, states and cou tries worked on each band, code speed and oth similar information.

Where To Obtain QSL Cards

The most convenient way to obtain a supply your own QSL cards is to buy them from one of t printers who advertise each month in *CQ's* clas fied columns. They send sample cards and quo prices upon receipt of a request accompanied by dime or so to defray handling costs.

Cards vary in cost from a minimum of $1.50 $1.75 per hundred for a simple, single-color card several times that amount. The factors that gove cost are the quality of paper stock, the number printing operations required, and the number cards ordered at one time.

As it takes just as much time to set up the pre to print a few cards as it does to print a thousan

* See "The Certificate Seekers Directory," by H. S. Bradley, W2QHH, CQ, February, 1953, p. 34.

he more cards ordered at a time, the less the cost er card. Cards printed with several different colors f ink cost more than single-color cards, because each olor generally requires a separate "run" through he press. For the same reason, cards printed on oth sides are more expensive than those printed on nly one side. They must go through the press an dditional time.

There are two theories about how QSL cards hould be printed. One is that only the call letters nd operator's name and address should appear on he face of the card, with all other information on he back. This is based upon the thought that any riting on the face of the card decreases its attrac- iveness. The other theory is that all information hould be on the face of the card, because, after the ard is hung on the wall or put in an album, no one an see what is on the back. Those without strong pinions on the matter usually choose the latter, ecause they cost less.

Home-made cards serve the basic purpose of a SL card just as well as commercially-printed cards, ut are usually less attractive. Of course, this is not lways true. Photographic cards made up by ama- eurs with darkroom and photographic printing quipment are usually very attractive, but are not

With the equipment shown in this picture, Ralston, WN5ZNN, has worked 42 states. Maximum power used is 70 watts. Antennas are ground planes for 40 and 15 meters, and a doublet for 80 meters.

commended to anyone trying to economize on his rds. Hand-lettered cards are also quite attractive nen the lettering is done by a competent craftsman. Actually, the home-made QSL card need not be imitation of a commercially-printed one. A nple confirmation typed on a plain card will suf- e until you obtain your regular cards. Something sembling the following will be satisfactory:

"Dear——, This confirms our CW contact on the 3.7-Mc. Novice band, February 10, 1954, at 10:30 a.m., CST. Your signals were RST 589X. I was using a 30-watt transmitter, a ½-wave doublet antenna, and a *NC-125* receiver. I would appreciate receiving a card from you confirming this contact. 73. W9EGQ, Herbert S. Brier, 385 Johnson St., Gary 3, Indiana."

Sending And Receiving QSL Cards

There is nothing mysterious about sending and ceiving QSL cards. You simply work stations and nd them cards. About two-thirds of the recipients will send you their cards in return (see "Broad Band," *CQ*, Feb., 1953). Considering that the exchange of QSL cards is completely voluntary and can be a fairly expensive item to the Ham on a limited budget, I think this is a fairly good percentage. However, some of the more-rabid QSL hounds get quite upset because they do not get 100% returns on the cards they send out.

The only way to get a 100 per cent return is to wait until the other fellow sends his card before sending yours. It makes you look cheap and you receive fewer cards per a given number of contacts, but it does work. The acid test comes when two members of the "*I-never-QSL-first*" school want to exchange cards.

Improving Your Percentage Of Returns

There are less drastic methods of getting the maximum return to the cards you send out, than refusing to QSL until the other fellow does. One difficulty facing the newly-licensed amateur is that his call and address may not appear in the *Call Book* until several months after he gets on the air. Consequently, he must send his full address to each station from whom he requests a card (unless the other station's address is in the book). This is time consuming, and frequently interference prevents the address from being copied correctly.

Possibly a better system is to arrange with a local amateur, whose address is in the *Call Book*, to have your cards sent in his care until yours appears in the book. Then you can simply say, "Please QSL in care of ——."

QSL promptly. If you procrastinate for a week or

Ralph Stohlquist and his Novice station, WN8NMG. His arm rests on the NC-125 receiver. The 35-watt transmitter is to the right of the speaker. Ralph worked 21 states and two Canadian provinces during ten weeks.

month after you make a contact before QSL'ing, the chances are good that the recipient will do the same thing, increasing the chances that your card will never be answered.

As already mentioned, a QSL card does not have to be elaborate to get results, but it should be neat. Make it look like you think it is important. Fill in all blanks carefully and legibly with a pen or typewriter. A card scribbled out in pencil gives the impression that the sender really did not think it was important enough to be treated carefully.

A card sent in an envelope gets more attention than one sent unprotected through the mails. For the extra cent it costs, your card gets more careful handling by the Post Office; it is not defaced by

(Continued on page 58)

ALL TIMES IN E S T

EASTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western Europe	1100-1500 (0-1)	0730-1530 (3-4)	1630-2000 (3-4) 2000-0500 (2)	1730-0300 (3-4)
Central Europe & Balkans	1000-1500 (0-1)	0700-1600 (3)	1700-2300 (3) 2300-0300 (2)	1800-0200 (3)
Southern Europe & North Africa	1100-1500 (1)	0700-1700 (3-4)	1700-2100 (3-4) 2100-0230 (2-3)	1800-0130 (3-4)
Near & Middle East	1100-1400 (0-1)	0630-1200 (1-2) 1200-1500 (2-3)	1800-2100 (2-3) 2100-2300 (1-2)	2000-2300 (1-2)
Central & South Africa	1130-1530 (1-2)	0630-1300 (0-1) 1330-1830 (3)	1800-0030 (2-3)	1930-2330 (1-2)
South America	1200-1600 (1)* 0900-1500 (2-3) 1500-1800 (3-4)	0600-0900 (3) 0900-1500 (2) 1500-1900 (3-4) 0000-0300 (2-3)	1800-0500 (3-4) 0500-0700 (2-3)	1900-0500 (3)
South East Asia	Nil	1630-1830 (0-1)	0400-0730 (0-1)	Nil
Australasia	1600-1900 (0-1)	0730-1030 (2) 1030-2000 (0-1)	2300-0100 (2-3) 0100-0800 (1-2)	0000-0700 (2-3)
Guam & Pacific	Nil	1500-2100 (1) 0800-1100 (1)	2200-0730 (3)	2300-0700 (2-3)
Japan & Far East	Nil	1600-1800 (1)	0200-0700 (1)	0300-0600 (0-1)
West Coast, USA	Nil	1000-1900 (3-4)	1900-2200 (3-4) 2200-0900 (1-2)	2000-0800 (3-4)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Western & Central Europe	Nil	0800-1500 (3)	1700-2000 (3) 2000-0400 (1)	1830-0230 (2-3)
Southern Europe & North Africa	1000-1300 (0-1)	0600-1500 (3-4)	1700-1900 (3) 1900-0100 (1-2)	1830-0100 (2-3)
Central & South Africa	1200-1500 (1-2)	0600-1300 (0-1) 1300-1800 (2-3)	1800-0000 (2-3)	2000-2300 (1-2)
Central America & Northern South America	1200-1500 (1)* 1000-1600 (4) 1600-1730 (1-2)	0600-1000 (3-4) 1000-1500 (2-3) 1500-1900 (4) 0000-0230 (2)	1800-0600 (4)	1900-0430 (3)
South America	1200-1600 (1)* 0800-1500 (3) 1500-1700 (4)	0600-0800 (3) 0800-1600 (2) 1600-1900 (4) 0000-0300 (2-3)	1800-0600 (3-4)	1900-0500 (2-3)

ALL TIMES IN C S T

CENTRAL USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Japan & Far East	Nil	1500-1900 (2-3)	0100-0800 (2)	0200-0700 (1)
South East Asia	1500-1700 (0-1)	1500-2000 (1)	0100-0800 (1)	0300-0600 (0-1)
Hawaii	1400-1800 (1-2)	1000-1900 (2-3) 1900-2100 (3-4)	2130-0900 (3-4)	2300-0730 (3-4)
Australasia	1600-1800 (1)	0700-1100 (2) 1300-1900 (1) 1900-2100 (2)	0000-0800 (3)	0100-0700 (2-3)

ALL TIMES IN P S T

WESTERN USA TO:	15 Meters	20 Meters	40 Meters	80 Meters
Europe & North Africa	Nil	0800-1300 (1)	1800-0100 (0-1)	1900-0000 (0-1)
Central & South Africa	1300-1500 (1)	0700-1500 (0-1) 1500-1800 (2)	1700-2200 (2-3) 2200-0000 (1)	1800-2200 (1-2)
South America	1200-1600 (1)* 0900-1700 (3-4)	0600-1400 (2) 1400-1900 (4) 2300-0100 (1)	1700-0400 (3-4)	1800-0300 (2-3)
Okinawa	1400-2000 (1-2)	1300-1900 (2) 1900-2200 (3-4)	0100-0600 (3)	0200-0500 (2)
Guam & Mariana Islands	1400-1900 (2-3)	1200-1900 (2) 1900-2200 (3) 0700-0900 (1)	0100-0900 (3)	0200-0730 (2)
Australasia	1400-1900 (2)* 1100-1900 (2-3)	0900-1100 (2) 1100-1800 (1) 1800-2100 (2-3)	2200-0800 (3)	2300-0700 (3)
Japan & Far East	1400-2000 (1-2)	1200-2200 (3-4)	2300-0800 (3)	0100-0600 (2-3)
Philippine Islands & East Indies	1400-1800 (1)	0800-1100 (2) 1300-2100 (1-2)	0200-0600 (1)	0300-0500 (0-1)
Malaya & South East Asia	1600-2000 (0-1)	1600-2200 (1)	0400-0700 (1)	0500-0630 (0-1)
Hong Kong, Macao & Formosa	1500-2000 (0-1)	1500-1800 (2) 1800-2200 (3)	0100-0600 (2-3)	0200-0500 (1)

Symbols For Expected Percentage of Days of Month Path Open:

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

* Indicates time of possible ten-meter openings.

Ionospheric Propagation Conditions

Forecasts by
GEORGE JACOBS, W2PAJ

144-40 72nd Ave.,
Flushing, Long Island, N.Y.

General Propagation Conditions

10 METERS—DX possibilities very poor, with only occasional South American openings expected and possibly an erratic Australia-West Coast, USA opening on propagationally good days.

15 METERS—Not much consistent DX (except for usual South American openings) expected on this band until next fall.

20 METERS—Band remaining open longer as the summer months approach. This will be best daytime DX band.

40 METERS—Seasonal absorption and atmospheric noise levels increasing, but generally fair to good early evening and night-time DX expected on this band during March.

80 METERS—Generally fair night-time DX to many areas of the world, but noticeably not as good during winter months, with band somewhat noisier.

160 METERS—Summer conditions are approaching for this band—that is, high noise levels, and generally weak DX signals. Some DX on quiet nights, with this month best for Australasian circuits.

This overall picture of band conditions is intended to indicate qualitative changes in each band from month to month. For specific times of band openings for any particular circuit, refer, as usual, to the Propagation Charts on the opposite page.

March is a significant month from a propagation viewpoint. March 21 is the occasion of the Vernal Equinox (the Autumnal Equinox occurs September 23). This is the day when the plane of sun's center crosses the equator as it travels northward. On this date throughout the world, day and night are of equal duration. This phenomena has its related effects upon radio propagation and DX conditions, and marks, in the Northern Hemisphere, the transition between winter and summer propagation characteristics. Summer characteristics are noted by a decrease in daytime usable frequencies and an increase in night-time usable frequencies on paths within the Northern Hemisphere. Atmospheric noise levels and ionospheric absorption also increase.

Prolonged ionospheric disturbances usually occur during the equinox months of March and September. Moderate to severe ionospheric disturbances are forecast for Mar. 1-4, 17-19, and 23-29, with the period during 10-15 somewhat unstable and generally below normal.

Northern — Southern Hemisphere Circuits

As explained many times in this column, there exist considerable differences between typical summer and winter propagation characteristics. For example, during the winter months, critical frequencies are higher during the daylight hours than they are during the daylight hours of the summer months. On the other hand, night-time hour critical frequencies are higher during the summer months than they are in winter. Ionospheric absorption and atmospheric noise levels are also usually higher during the summer months than during the winter.

On long circuits, going from one hemisphere to another, it is often very difficult to define summer or winter propagation conditions, since there is an opposite season at each end of the circuit. For example, during December, it is winter in Washington, D. C., (latitude 39 degrees N) while it is summer in Melbourne, Australia (latitude 38 degrees S). For this reason, these circuits during the summer and winter months are subject to a maximum amount of absorption and atmospheric noise interference, at one end of the circuit or the other, noticeably on 40 and 80 meters.

During the equinoctial periods, however, a sort of equalization effect takes place. During these months, which corresponds to the spring and fall seasons, propagation conditions at both ends of the circuit are quite similar, rather than completely opposite as they are during the summer and winter months. Accordingly, there is on these circuits, considerably less ionospheric absorption, and lower overall noise levels during the equinoctial months. This results in an improvement for these circuits on most amateur bands. Especially noticeable should be the improvement on 40 and 80 meters, with many more signals expected to be heard on these bands from Australasia, etc., than were heard during the night hours of the winter months. There is also the possibility that March and early April will prove to be the best months for working 160-meter DX on these long circuits between the Northern and Southern Hemispheres.

W2PAJ discussing short wave radio propagation conditions with other amateurs during a world wide international radio broadcast. Left to right: W2PAJ, W2ESO, W2SKE and W2NVH.

Sunspot Count

This month's **Propagation Charts** are based upon a predicted **smoothed sunspot number** of 11, centered on March, 1954. So that the sunspot information appearing in February's column can be kept up to date, observed sunspot data will henceforth be included each month. The observed monthly Zurich sunspot number for December, 1953, was 1.7; this results in a smoothed sunspot number of 14.9 centered on June, 1953.

This month's forecast is based upon basic ionospheric data made available by the Central Radio Propagation Laboratory of the National Bureau of Standards. For calculation purposes, a CW effective radiated power of 150 watts is assumed. For a complete discussion of the parameters used in determining these forecasts refer to the January, 1954 column.

Anniversary

This month begins my fourth year as Propagation Editor for CQ magazine. I have found conducting this column a very stimulating and interesting sidelight to a fascinating hobby—Amateur Radio. I want to thank all of you, whom, during the past three years, have taken the time to drop me a line expressing your interests in shortwave radio propagation, and this column in particular.

I also feel that special recognition is due the past and present Editors of CQ magazine, for recognizing the importance of familiarizing radio amateurs with the correlations that exist between shortwave radio conditions and ionospheric variations. Shortly after the war, when CQ was not much more than a year old, O. P. Ferrell (now CQ's Managing Editor), inaugurated "Monthly DX Predictions." Since that time, monthly propagation discussions have been a unique feature of CQ, the only technical magazine presenting this information for Hams.

Next month's column will be devoted to a special discussion of the ionospheric warning services of the National Bureau of Standards.

Gathered by DICK SPENCELEY, KV4AA

Box 403, St. Thomas, Virgin Islands. USA.

Our heartiest congratulations go to the following station upon his entry to WAZ:

No. 295 LU8EN Hector Soula 40-203

We also welcome the following newcomer to the HONOR ROLL:

W6TXL 38-153

At Time of Writing

WINDWARD ISLANDS, VP2GRO: Bob Roberts, G2RO, continuing his Caribbean "safari," and after a very pleasant visit to KV4AA on December 20, was on the air as VP6RO, Barbados, between Dec. 23 and 30. Some 200 QSO's were made from this QTH. Going on to Grenada the fifteen-watter was put on the air on Jan. 2, using the call of VP2GRO. As this was a comparatively rare spot for CW contacts Bob did his best to relieve this situation. Early QSO's were noted with the following: W2AWH, W6NTR, W3PGB, W8DMD, W1WAI, W4FU, W9LNM, VE1ZZ, ON4FL, W1WLW, W4GG, W3EFZ, W7AMX, W6JKH/2, W3HUS, G6YQ, W8BOJ, W3RXM, W9TKV, W2QKJ, W6FOZ/6, W1DSF, CE4BX, VE1CU, W6MX, W1LQQ, W6TI, W3CPB, W2EMW, W3EPV, W7GBW, W2BJ, W6TXL, CT1JS, W7KWO, W2DTV, EA1BC, VP9BM, W9GRV, W6APV, W6CUQ, W6MUR, W8EV, W9YFV, and W1AB. Bob terminated his very productive stay at this QTH on Jan. 11th at 2330 GMT with a last minute 7-Mc. QSO with ON4AU. He then moved on to VP4, Trinidad, where a two-week stay was anticipated. His last stop will be in British Guiana for a three-day period after which he sails for England, from VP5, on or about Feb. 9. Thanks for the nice job done, Bob, and we all shall look forward to contacts with you at the many rare DX spots you plan to visit in the near future.

NAVASSA ISLAND, KN4 (?): Ed, KV4BD, advises that he, and two or three other Hams, will definitely set up a station from this QTH for a period of from two to three days around March 10 to 15. A 32V3 transmitter and 75A3 receiver will be used. Operation is planned on 21, 14, 7 and 3.5 Mc. Phone and CW. This island is off the southwestern tip of Haiti and is a U.S. Possession under the jurisdiction of Puerto Rico. Whether or not this spot could conceivably qualify as a "separate one" is in doubt, but the trip will take place in any case. Word from Washington is expected shortly as to what call will be used.

COCOS ISLAND, TI9AA: Heino, operator of t German underseas photography ship "XARIFA DI9AA, will visit Cocos Island some time in F ruary. Permission has been granted to operate station from this QTH using the call letters TI9AA. A gas driven generator is available a Heino was loaned an 80-watt rig for the purpo through the kindness of KZ5NM. Every effort w be made to put TI9AA on the air. The accent w be on phone operation in the vicinity of 14050 although CW will also be given a whirl. QSL's m be sent care of TI2TG.

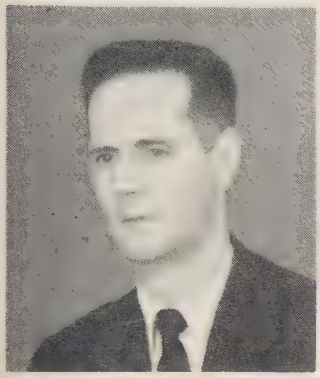
THAILAND, HS1D: This station has been heard in the Caribbean area on 14075, 1200 GMT. We learn, via VK3CX, that he is none other than ex-TA3FAS and was running 100 watts. He now has a full gallon QRV which feeds a rhombic directed at Washington D.C. He hopes for an early relaxation of the present ban which prohibits W/HS contacts. (We are advised that the ban, in this case, would be immediately dropped should a letter be received from the Thai government to the effect that they have no objections to HS-W contacts.

SEYCHELLES ISLANDS, VQ9NZK: This expe tion was scheduled to have sailed for this QT (From Africa) on February 7 for a period of fro ten to twelve days. Activity will take place on t main island of Mahe. Side trips are planned lat possibly to Aldabra Island, VQ7, and Camaran land, VS9. They will return to the Seychelles May for a stay of several months while making motion picture. /MM is planned enroute.

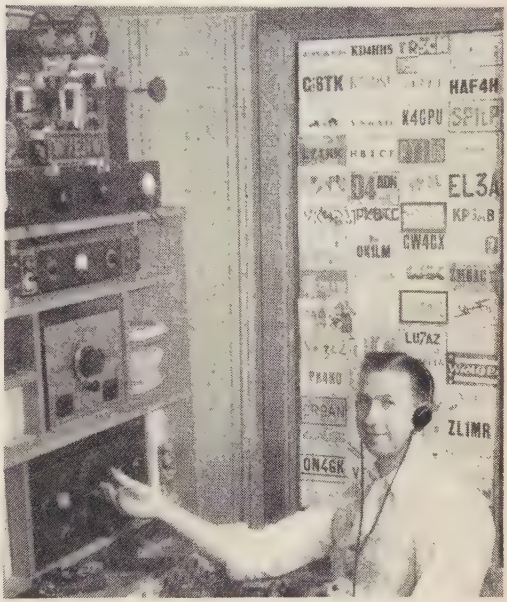
EASTER ISLAND, CEØAC, CEØAD: Herein we have good tidings to those stations who missed a contact with CEØAA last August. CE3AG advises that CE3DG, Jorge, is scheduled to arrive at Easter Island on or about January 20. He will install the 40-watt phone rig which will be operated by the island's doctor under the call letters of CEØAC. He will also install a BC-610 transmitter to be used by the Chilean Air Force for meteorological announcements. The operator of this rig is authorized to contact amateurs using the call CEØAD. This station will operate especially

(Continued on page 40)

Attending the 5th Annual Joint DX Conference of the Northern and Southern California DX Clubs were this distinguished group. Reading from left to right: Roger Mace, W6RW; Herb Haley, W6VBY; Bill Orr, W6SAI; Herb Becker, W6QD; Larry LeKashman, W9IOP; Andy Elsner, W6ENV; Vic Clark, W4KFC, John Beck, W6MHB; Dick Bellew, WØBFY and Ed Schmeichel, W9YFV.



CT2BO, Gil Carreiro, Ponta Delgada, Azores, Gil has been very generous in handing out CT2 CW contacts to most of us.



W7ENW, Wally Hagestad, of Portland, Ore., needs no introduction to the DX fraternity. Wally holds WAZ and, on last report, has worked 181 countries.

Testifying to his legality and authorized by both the government and military forces, XW8AA, Vientaine, Laos, may be seen above while representing "radio communications" in a recent national exhibition. Operator Labailly runs 40 watts on phone and CW and is very active. The robed visitors are "Bonzes" and the Laotian flag may be seen on the top of the beam. XW8AA is the only station licensed in Laos for the moment and hopes for early world-wide recognition.

Iceland is well represented on DX bands by these ops. (L to R) Sigurdur, TF3SF; Asgeir, TF3AB; Magnus, TF3MB, and Haraldur, TF3NA.

on CW and will use a frequency near the low end of 14 Mc. For phone operation CEØAD may be heard on 14100 kc. QSL's go via the RCC. Casilla 761, Santiago, Chile. These stations are on a permanent basis.

KERGUELEN ISLANDS, FB8XX: Joe Klein, ex-op of FB8ZZ, is now active. Frequencies to watch are 7020 and 14040. He has been heard, on the latter QRG at 1500 GMT.

SWAN ISLAND, KS4: Activity from this spot has been partially revived by the appearance of W4NXE/KS4 on 14-Mc phone. Length of stay is, at present, unknown.

SAN ANDRES ISLAND, HK1: This island, located some 400 miles west of Cartagena and 200 miles north of KZ5, is a Colombian possession which might qualify as a "new one." This spot was brought to our attention by TI2TG who advises us that HK1GP, Victor Abraham, is active there. Vic, apparently new to the Ham game, was QSO'd on 7015 phone at 0200 GMT. TI9UXX has suggested that another Colombian spot, the island of Malpelo, situated in the Pacific some 300 miles due west of Buenaventura, might be viewed as "separate" as it is quite similar in its position to Colombia as Cocos is to Costa Rica.

PORTUGUESE TIMOR, CRIØAA: As a result of many inquiries regarding a resumption of Ham activity from this rare spot, we have the following information from Patricio J. da Luz, Radio Dili, Timor, who operated old CRIØAA along with Cunha d'Eca: "When Cunha returned to Lisbon he took the station with him and as there is no way to obtain radio gear in Timor I have been off the air. If the fellows want me back on the air it will be necessary for them to furnish me with the equipment and I will be glad to cooperate. CR9AH has agreed to furnish me with QSL's." (So there it is gang, let's see if we can get together and help him out) CR9AH advises that shipment may go via John Manners and Co. of Hongkong which operate a line into Timor.

WINDWARD/LEEWARD ISLANDS, VP2: For those who may want contacts with these spots we would like to mention that a very efficient phone net exists on 3865 kc. This is known as the V.I. (Virgin Islands) net. Organized by Ed, KV4BD, this net is on daily at 1100 GMT and the following stations are in attendance: KP4TO, KP4WN, KP4MV, KV4AA, KV4AI, KV4AZ, KV4BD, VP2VA (Tortola, Br. Virgin Is.), VP2KG, VP2KM (St. Kitts). VP2MC, VP2MY (Montserrat), VP2DA, VP2DL (Dominica), VP2AL, VP2AI (Antigua). VP2LA (St. Lucia), VP2SH (St. Vincent), VP2GX (Grenada) and VP6DS (Barbados). Additions which include VP4 and HH are expected shortly. Any net station stands ready to contact any outside station upon request.

BRITISH SOMALILAND, VQ6UU: Our old pal Jim, 098, Jamie, ST2UU, showed up in Berbera, British Somaliland, on January 7. His plans called for six week stops at VQ6, FL8, 4WI (Yemen) and, possibly, HZ1. After January 10, Jim was not heard and we received a rather startling letter from him which we will quote in part: "The trouble started right off at VQ6UU. I started off working all the fellows in the usual manner, this was OK, but then the time came along when I wished to keep some of my few prearranged schedules with G and KV4 stations. I called on schedule requesting an answer on 14080 many times. Each time the whole of Europe came back on that frequency. Then I called G stations asking them to reply on 14080. One G came back saying that my frequency was waterlogged with guys calling me and I could not be copied. I then gave a long call saying that calls would only be answered on 14080. This had absolutely no effect. I begged and pleaded with them to answer on 14080 only, but no, they still fouled up my frequency calling me. Now I can stand a lot of things but this was too much and something finally 'snapped.' I said to myself, well, if I cannot control them and they will make no attempt to control themselves, it's time I finally quit Ham radio!!—and—that is just what I have done. In the future I shall stick to white mice as they, at least, have some ideas about good manners. I have gotten a big kick out of Ham radio up to a point. Now it has kicked me right out of business!!—." (Our readers' reactions to this may be varied. Some may say that better control might have been exercised even with the single xtal frequency that Jim had. Others may disagree. Putting in our two cents worth, we would say that three or more crystals would have gone far to help such a situation. We think it is a shame that, in spite of the many words appearing on this subject, "common sense" DX ethics are observed by so few. This is especially true of an expedition of this type where a Ham assumes the work, expense and personal risk of such an operation for the sole purpose of providing his fellow Hams with a new country. Only an operator who has actually been at a rare DX spot can get a good idea of the mental strain caused by countless provocations due to the dim-witted techniques of those stations calling him. It is safe to say that almost every DX expedition has, at times, felt like throwing up the sponge for these causes. On the other hand it should be well known to any expedition-minded Ham that these things are to be expected and a resigned mental attitude taken towards them as far as possible. For as long as the motto "All's fair in love, war and DX" persists, that's the way it's going to be.)

We are glad to say, however, that this item has a happy ending. Jim did come back on the air on Jan. 18 (From VQ6UU) and advised us that, in response to some twenty-seven letters received, he has decided to come on the air again. He now has additional xtals. VQ6UU will be on until Jan. 26, when he leaves for FL8UU for a ten-day stay. 4WI will follow. QSL's should go via RGSB/G2MI as Jim may not be back at ST2UU for some time.

DX Notes In General

VR6AC put in an appearance on Xmas day, from 10 to 1300 GMT, with an extremely potent signal on appro 7030 kc. The name is Floyd and he claims to be runni 850 watts into a multi-collinear beam directed Europe. QSO's with W8WZ and W5RX were noted . **PX1AC** has been active 060/090, 1800/2000 GMT. As y we have been unable to garner his QTH or word as his legality . . . YP1 activity seems to have been on t phony side. W9HUZ reports that ZC4XP was in Er

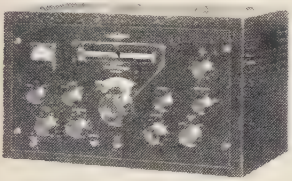
(Continued on page 62)

HARVEY ALWAYS HAS IT...IN STOCK For IMMEDIATE DELIVERY

COLLINS 32V-3 Transmitter

A VFO controlled bandswitching, ganged tuned amateur transmitter. 150 watts input on CW and 120 watts on phone. Covers 80, 40, 20, 15, 11 and 10 meter bands.
Dimensions: 21⅛" wide, 12-7/16" high, 13⅞" deep.
Complete with tubes $775.00

The COLLINS 75A-3 Receiver



With Mechanical Filter

The familiar Model 75A-2, redesigned and modified to provide for the use of mechanical filters. Supplied with one 3 KC filter, and facilities for one additional. A 2-position front panel switch permits selection of filter desired.

Complete (less speaker) $530.00
Speaker 20.00

SUPERIOR POWERSTATS

Smooth, efficient voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.

Type 10, 1,25 amps	$ 8.50
20, 3 amps	12.50
116, 7.5 amps, table mtg.	23.00
116U, 7.5 amps, panel mtg.	18.00
1126, 15 amps	46.00
1156, 45 amps	118.00

Complete Stock Always On Hand For Immediate Delivery

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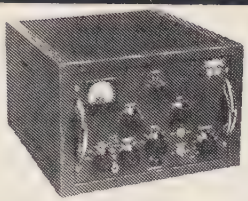


The New 1954 SONAR SRT-120 Mobile-Fixed Transmitter

Retains all the outstanding features of the earlier model SRT-120 plus the following new features:

- Improved RF Circuitry
- Illuminated Meter
- Heavier Gauge Steel Cabinet
- New Antenna-Loading Circuit for Better Matching on All Bands
- ⅛ inch Aluminum Front Panel
- Perforated Cabinet Top for Improved Ventilation.

Complete Kit with Tubes $159.50
Factory Wired and Tested 198.50

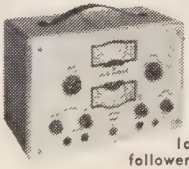
SRT-120-P same as above but with built-in push-to-talk relay and self contained power supply for 120 volt AC line.
Complete Kit with Tubes $198.50
Factory Wired and Tested 279.50
External VFO Head 19.95

THE NEW S & W MOBIL-CEIVER

A fixed frequency receiver for use with converters. Has self contained power supply and speaker with reserve power for converter. Other features include: Automatic noise limiter — Variable selectivity — RF and audio gain controls — Send-receive switch — Highly stable BFO — Image-rejection better than 60 db. Operates from 6 and 12 volt input.

Complete with tubes $89.50

2 New RCA Portable Signal Generators

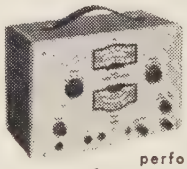


RF SIGNAL GENERATOR
Model WR-49A

— Has DC isolated, cathode-follower outputs so that signals can be injected into any point in the circuit. New dial design facilitates accurate readings. Thorough shielding minimizes radiation, and hum pickup. Other outstanding features include:

- Frequency Range: 85 kc to 30 mc
- Calibration accuracy on all bands ± 1%
- Built-in 400-cycle oscillator for internal modulation or external use
- Modulation continuously variable up to 70%
- Attenuator Range: 65 db
- Weighs only 8 lbs.

Complete with tubes, shielded cable, and instructions $59.50



AUDIO SIGNAL GENERATOR
Model WA-44A

—Extremely valuable for measuring performance of amplifiers, tone controls, equalizers, loudspeakers, and other audio circuits and components. Has DC isolated cathode-follower outputs so that signals can be injected into any point without loading the circuit or reflecting any reactance.

Other outstanding features include:

- Frequency Range: 11 cps to 100 kc
- Response ±1 db
- Additional 60-cycle signal for Intermodulation Distortion tests
- Regulated oscillator power supply
- Weighs only 10 lbs.

Complete with tubes, shielded cable, and instructions $87.50

R. C. A. MICROPHONES

Broadcast quality units of tested and proven performance ideal for on-the-air and recording studio applications. Known to, and preferred by leading sound engineers.

Model 44-BX (Ribbon) $129.00
Model BK-1-A (Pressure) 79.50
Model 77-D (Poly-Directional) 175.00

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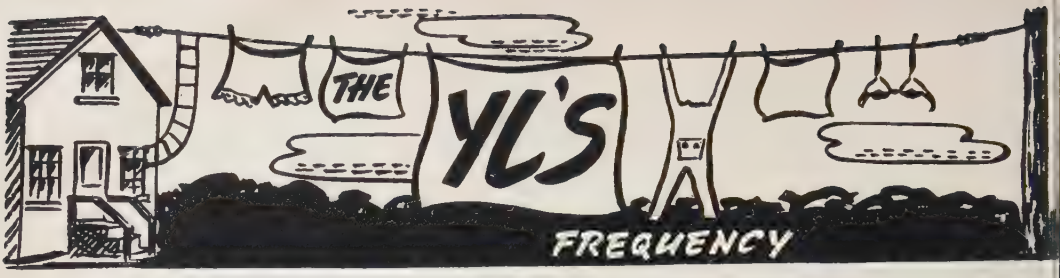


Monitored by LOUISA B. SANDO, WØSCF/7

9638 N. 16th St., Sunnyslope, Phoenix, Arizona

Almost every OM who has an XYL, has wished at one time or another that he could get her interested in Ham radio. How to do it?—that's the challenge. Of course, there are many XYLs who have been exposed to Ham radio for so many years it holds no interest for them. On the other hand, there are XYLs who would like to get their ticket, if only to make the OM happy.

W9UXL, Lois Zehr, suggests that the gals need some encouragement and that maybe we can lend the OMs a helping hand by a few words especially for the XYLs.

"First of all," says Lois, "tell them that a person

Your editor enjoying the "loot" won at the Southwestern Division Convention in Los Angeles last October. A complete station, it consists of an HT-20 transmitter and SX71 receiver, with loudspeaker; also included was a shielded antenna relay. Photo courtesy W5VDY.

doesn't have to be a genius, radio master mind, whiz with electronics, or have years of study to be a Ham. The average housewife and mother can pass the FCC test easily. (I did—that proves that!)

"Secondly, since as the old saying goes, 'One doesn't like what one doesn't understand,' it would be a good idea to explain some of the radio terms. Mercy, the vernacular of a couple of Hams could keep even the local busybodies on a party line wondering what they're talking about. For instance, the 'Ham Shack' isn't a shack, a horrible little shanty parked on the estate some place. Quite often, as in our case, it turns out to be the nicest room in the house.

"The 'bucket of bolts' turns out to be a neat transmitter worth a couple of hundred dollars. The 'OM' isn't necessarily an old man. He could be 16 or 60, more or less. A couple of 'harmonics' turn out t be children (a pair of 5-year old twin daughter when W9OQI mentions them). And W9OQI, 'Th Old Queer Individual' turns out to be a young, goo looking, intelligent individual (I admit I'm pre udiced).

"He is the one who inspired my interest in Ha radio. My woman's curiosity got the best of m when he was on Novice CW so I learned the code I then decided to study the *License Manual* a little— about a week's study and the average YL can pas the Novice test. Then about six months on the ai as a Novice and some more wear and tear on th *License Manual* and then the General Class test— nothing to it, really.

"Last of all, tell the gals how much fun amateu radio is—turn a few knobs, flip a switch or so, an we can communicate with any part of the worl right from our own homes. And maybe you coul mention that the day that radio license comes th OM will be so pleased with his XYL he'll buy he anything she wants (providing it's new radio gear!).

Lois, by the way, now operates on 75 phone usin a *Viking I*, VFO, and a center-fed halfwave antenna

Dust Mop or Mike?

Of course, once an XYL gets her Ham licens she's apt to be in for a lot of good-natured kidding— such comments as her preferring the mike to th

W4UMM—And I'm knittin' while I'm sittin'—W4OP

dust mop. W4UMM, Sarah Abbott, and her OM W4OPE, came in for plenty of ribbing when *Th Atlanta Ham*, newssheet of The Atlanta Radio Clu carried the accompanying photo of W4UMM an W4OPE, with Sarah at the mike and her OM kni

(Continued on page 66)

ACAPULCO... calling CQ

. . . to radio amateurs throughout the world—to announce the finest HAM CONVENTION ever held!

COME to ACAPULCO, MEXICO

May 27, 28, 29 and 30, 1954

The LIGA MEXICANA DE RADIO EXPERIMENTADORES, Asociacion Civil (LMRE) sends Greetings and invites all radio amateurs to the 22nd ANNUAL MEXICAN AMATEUR RADIO CONVENTION. Convention headquarters will be in the beautiful HOTEL PAPAGAYO. Complete details may be obtained from W6DI by mailing in the coupon below.

PROGRAM

(Manufacturers display open May 24 in the Hotel Papagayo)

MAY 27

Registration of amateurs.
Luncheon sponsored by Acapulco Club.
Opening address and inauguration of the convention by the Governor of the State of Guerrero, the Secretary of Communications and other Federal Officials.
Program by the Official Symphonic Orchestra of the State Government.
Extravaganza of Mexican Talent.

MAY 28

Official Sessions.
Cultural Sessions by the Department of Radio Meteorology, Geodetics and Geography.

MAY 29

Excursions with Luncheon and Dinner at the Icaca Naval Base.
Official and Technical Sessions.

MAY 30

Executive Session of the LMRE.
Entertainment.
Closing address by the Governor of Guerrero.
Official banquet and dinner dance.
Prize Drawings.

Plus many other interesting events.

Registration Fee - - $15.00

($7.50 for your XYL or for each additional person in your party)

The LMRE will reserve admission to this convention to radio amateurs, technicians and experimenters. Payment of the registration fee entitles one to Associate Membership for 1954 in the LMRE (not voting rights), to attend the official banquet, to participation in the entertainment programs, to hotel discounts, to participation in the sightseeing tours (subject to travel agency schedules) AND will expedite processing of portable and/or mobile XE licenses for qualified member amateurs. (PLEASE NOTE: The LMRE assumes no responsibility if the applicant should not qualify for a license in the judgment of the Director General of Telecommunications.)

IN ACAPULCO you can enjoy the incomparable panorama of surrounding mountains, the ancient village of Acapulco, and an Armada of yachts serenely riding at anchor.
Enjoy the thrill of water sports: there's swimming, water skiing, sailing and deep sea fishing. Acapulco also boasts a fine golf course, a new fronton court where exciting Jai-alai is played nightly, and a new bull ring where the most popular toreros appear.
EASY TO REACH. There are several ways to reach Acapulco—Many prefer the swift flight in the planes of **Aereonaves de Mexico.** One and a quarter hours in the air over rugged mountains and silvery rivers, span the trip from Mexico City. It is also convenient to take the leisurely way from the capital city by motoring a distance of about 280 miles. There are good roads, too, which form connecting links to the border towns between Mexico and the United States.

LMRE

Patented

Guy H. Dennis (W6DI) U.S. Convention Manager.
655 Firth Ave., West Los Angeles 49, California.

Rush me complete details on LMRE Convention ☐

Check enclosed for $.....for.....registrations.
(Make all checks payable to Guy H. Dennis, Trustee)

Name..... Call.....

Address.....

City.....Zone.....State.....

What's NEW in HAM RADIO

Parts Products Catalogs

Say That You Saw It In CQ!!

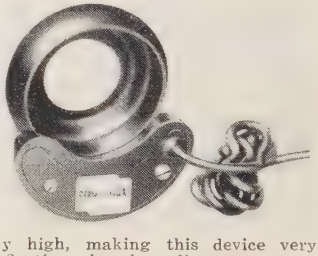
This will really make the average Ham start thinking about v-h-f-operation! The accompanying illustration shows the new Stewart-Warner **Portaphone**, an FCC-approved Class B telephone transmitter/receiver operating in the Citizen's Band, on a fixed frequency of 465-Mc. This is indeed a far cry from the wobbly, lopsided transceivers of the old 5 meter days! The **Portaphone** is a two-tube transceiver, which operates from either 115 volts a.c. or a portable battery pack, and delivers 500 milliwatts to the built-in dipole antenna. The **Portaphone** makes maximum use of

printed circuits, and has a frequency stability of better than plus or minus 0.5 per cent over a temperature range of 0 to 125 degrees Fahrenheit! (Match this with a 465 Mc. oscillator, you v-h-f men!)

Any citizen of the U.S. (over 18 years old) can obtain an operational license from the FCC for this type of equipment. The **Portaphone** may be obtained thru electronic jobbers who handle industrial electronic equipment. Additional information may be obtained from **STEWART-WARNER Corp.**, Commercial Products Division, 1826 Diversey Pkwy., Chicago, 14, Ill.

Here's the gentleman's answer to a perfect phone patch! If you have trouble with dangling wires from a haywire patch, or have run afoul the local phone company for using a phone patch, the **Perm-O-Flux Corp.** has the answer for you!

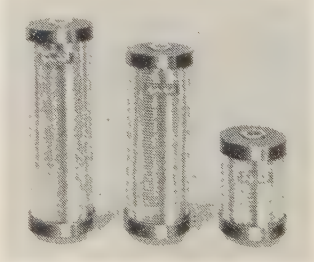
The **PERM-O-FLUX Telephone Pickup (Model M-53A)** slips over the ear piece of a telephone handset, and is then connected to any high impedance input circuit, such as a tape recorder, or into a crystal mike jack. No electrical connection to the telephone is required. The intelligibility, articulation and output of the **M-53A** unit are extreme-



ly high, making this device very effective when long-distance conversations are handled.

As a final clincher, the price of the Pickup unit is very modest. Additional information on the **PERM-O-FLUX Telephone Pickup** may be obtained from the manufacturer: **PERMOFLUX Corp., 4900** West Grand Ave., Chicago 39, Ill.

The **"Radio Amateurs' Mobile Handbook"** devotes quite a bit of space to the design of efficient loading coils for mobile operation. As a big step in the direction indicated in the Handbook, **MASTER MOBILE MOUNTS**, Inc. has announced a new series of high Q loading coils available for the 20, 40 and 75 meter bands. These coils are air

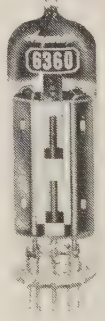


wound, yet extremely rugged. They are fully weather-sealed and factory pre-tuned to each band. The coils are interchangeable, and will fit the standard **MASTER MOBILE** whip. They are available at leading radio jobbers, and additional information may be had by writing: **MASTER MOBILE MOUNTS**, Inc. 1306 Bo St., Los Angeles 36, Calif. Nuf se

Ever try to explain the fun mentals of electricity to an int ested neophyte who didn't know live wire from a short circuit? isn't easy, and considerable ti and effort has been expended schools and instructors trying evolve a simple means of expla ing the fundamentals of electric —not an easy task for even the b teacher.

As an aid for the interested ginner, the **UNIVERSAL SCIE TIFIC** Company's new **Beginn Experimental Kit in Electricity** just the ticket. Using this kit student can teach himself the pr ciples of d.c. and a.c. circuitry, building and operating the m than 190 assemblies described the illustrated 240 page instruct manual.

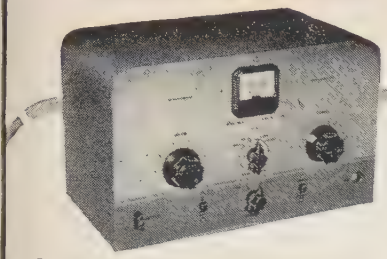
The emphasis of this kit is "learning by doing," and instr tion by visual demonstration. S an item as this is invaluable schools, and those amateurs w have children or friends who are



terested in starting their ed cat in the field of electricity would well to investigate this inexpens training kit. Scout groups, 4 clubs and employee training p grams would make efficient use a kit of this type. Complete inf mation and a copy of the instr tion manual may be obtained fr the **UNIVERSAL SCIENTIFIC C** 1102 Shelby St., Vincennes, Indian

Here is a little honey! The bra new **AMPEREX 6360** twin tetr tube. About the size of a 6A

(Continued on page 57)



Heathkit AMATEUR TRANSMITTER KIT

Range	80-40-20-15-11-10 meters
6AG7	Oscillator - Multiplier
6L6	Amplifier - Doubler
5U4G	Rectifier
105-125 volts AC 50/60 cycles 100 watts	
Size — 8⅛" high x 13⅛" wide x 7" deep	

MODEL AT-1

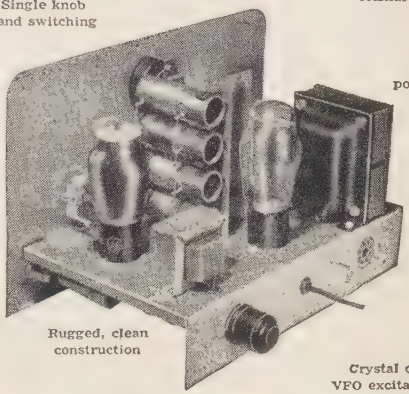
$29.50

SHIPPING WT. 16 LBS.

Pre-wound coils — metered operation

52 ohm coaxial output

Single knob band switching



Built-in power supply

Rugged, clean construction

Crystal or VFO excitation

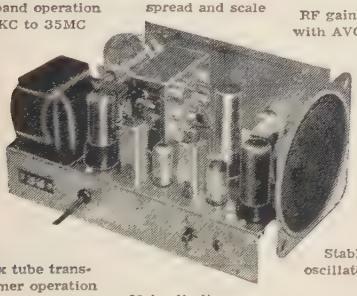
Here is the latest Heathkit addition to the Ham Radio field, the AT-1 Transmitter Kit incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation-up to 35 watts input. Built-in power supply provides 425V @ 100MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis and detailed construction manual. (Crystal not supplied.)

New HEATHKIT COMMUNICATIONS RECEIVER KIT

Four band operation 535KC to 35MC

Electrical band spread and scale

RF gain control with AVC or MVC



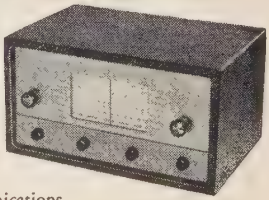
Six tube transformer operation

Noise limiter — standby switch

Stable BFO oscillator circuit

5½" PM speaker — headphone jack

Range	535KC to 35MC
12BE6	Mixer oscillator
12BA6	IF amplifier
12AV6	Detector - AVC - Audio
12BA6	BFO oscillator
12A6	Beam power output
5Y3GT	Rectifier
105-125 volts AC 50/60 cycles 45 watts	



A *new* Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical band spread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

$25.50

SHIP. WT. 12 LBS.

CABINET

Proxylin impregnated fabric covered plywood cabinet. Ship. wt. 5 lbs.
No. 91-10. **$4.50**

THE IMPROVED Heathkit GRID DIP METER KIT

- **Pre-wound coil kit**
- **Range — 2MC to 250MC**
- **Meter sensitivity control**
- **Compact one hand operation**
- **Headphone monitoring jack**
- **Transformer operated**

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasitics, correcting TVI, etc. Receiver applications include measuring C, L, and Q of components, determining RF circuit resonant frequencies, etc. Thumbwheel drive for convenient one hand operation. All plug-in coils are wound and calibrated (rack included). Headphone panel jack further extends usefulness to operation as an oscillating detector.

MODEL GD-1A

$19.50

SHIP. WT. 4 LBS.

HEATH COMPANY
BENTON HARBOR 6, MICHIGAN

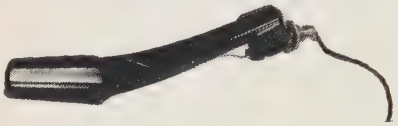
Two additional plug-in coils are available and provide continuous extension of low frequency coverage down to 355KC. Dial correlation curves included.
Shipping Wt. 1 lb.
Kit 341. **$3.00**

ESSE PRE-INVENTORY CLEARANCE—SPECIALS!

Never to be repeated items at close-out to be removed permanently from our records. Radio parts dealers, servicemen, etc., stock up now. Items priced in lots may be ordered singly only when total order amounts to $5.00 or more. Include postage on parcel post orders. All express, freight orders shipped collect. All items this page brand new.

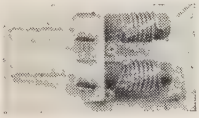
BOOKS FREE—With each purchase of $10.000 or more, we include free Sams regular $3.95 first edition Red Book and GE's 35c tube manual—ALL FREE!

G.E. VARIABLE REL. CART. & TONE ARM



Lists at $19.95. New with GE Var. Rel. cart. & permanent sapphire stylus. For 10" & 12" LP records. Buy for cartridge only..... **$2.95** ea.

TV TRAP. Lots of 10, 29c ea.



Top quality TV trap. Primarily used as antenna loading coil for GI TV front end tuner. Brass slug tuned. 3/8" dia. coils of 7 turns ea. Ideal for interference trap on your television.

10 FOR **$2.90**

WIDTH CONTROL

LOTS OF 10, 29c EACH

Width control equivalent to RCA #201R2 for use with TV sets using tubes with 30 KV. Anode supply.

10 FOR **$2.90**

VERTICAL OUTPUT TRANSFORMER

Philco 32-8454-1 electrically similar to RCA 204D9 Pri. to Sec. turns ratio 10.9 to 1. Size: 2¼"x 2"x1¾". Mtg. ctr. 2⅞". ..... **79c** ea.

FILTER CHOKE

7 Henry 150 Ma. 200 ohm DC res. Size overall 4"x2½"x2". **$1.29** ea.

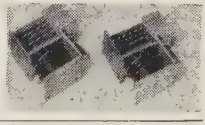
6V VIBRATOR TRANSFORMER

Philco 32-8813-1 6 V. Vibrator transformer 280 V. output @ 60 ma. Size 2-5/8"x2-3/16"x2" half shell chassis mtg. ..... **95c** ea

RELAYS AC 24 V. or 110 V.

110 Volt AC relay with two sets of SPDT contacts and one set of SPST contacts. 24 Volt AC relay with 4PST contacts. Mfd. by Leach.

Choice **79c** ea.



DC HERMETICALLY SEALED RELAY

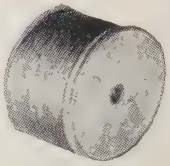
Potter Brumfield MT2128-5 relay. 365 ohm coil pull in at 12-15 volts DC. 4PDT twin palladium contacts hermetically sealed in the M can with 3 stud mtg. and 14 pin solder terminal header. Relay tested at 10G vibration at 5-60 CPS.

Brand new **79c** ea.

GUY WIRE — 5,000' spool — $1.95 per 1,000'

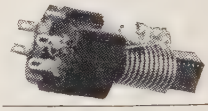
Extra strong snarl, and rust resistant cable. Originally used for aircraft control cable, has 21 strands alloy brass plated to resist corrosion. 350 lb. breaking test. OD 3/64". Ideal TV Antenna guy wire. Wound on wood & metal spool of 5,000' length.

Per spool **$9.75**



RCA TV IF XFORMER

Lots of 10, 29c ea.

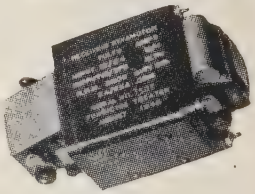


RCA Part #71507 TV IF transformer 21 Mc. Used as 1st IF in many popular TV receivers such as Radio Craftsman, TRAD, etc. 10 for **$2.90**

PM DYNAMOTOR 12V.

12 or 24 volt DC input @ 8/4 amps. Output 275 volts @ 110 ma. Dimensions: 7½"L x 2⅞"W x 4¼"D. Ship. wtg. 10 lbs.

$3.95 ea.



VERTICAL OUTPUT TRANSFORMER

Heavy duty shielded vertical output transformer similar to 204T2. Pri. to Sec. turns radio 10:1. Size 2¾"x 2¼"x2¼". Mtg. ctr. 3⅛". ..... **95c** ea.

12 V. VIBRATOR TRANSFORMER

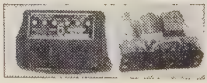
300 V. @ 65 Ma. output. Ideal for your new car receivers. High quality type transformer designed originally for aircraft. Size overall 2⅞"x2½"x2⅝" ..... **95c** ea.

AN SWITCHES

AN switches similar to one pictured in DPDT, SPST, DPST, etc. momentary and regular types, some new, some used. Hi current capacity. Misc. assortment cannot be split.

10 FOR **$2.95**

TUNING UNIT BC-746

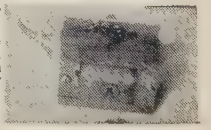


Brand new tuning unit with FT243 crystals, 6335 rec. & 5880 xmtg. RF & ANT coil 140 mmfd. midget variable, coil forms, sockets, resistors, etc. in wrinkle finished fibre case. Size 4"x2¾"x1¼. **79c** ea.

MOTOR CONTROL AUTOFORMER

Here is a useful autoformer made for controlling small 110V. AC motors. Inserted in one side of AC line its 4 Position switch allows for off, full, ¾, and ½ input voltage. Use on motors up to 1/20. HP. Size: 2½" x2½"x2⅛".

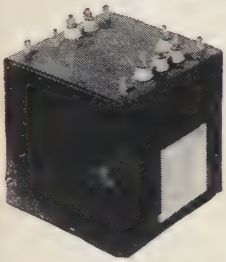
NEW **95c** ea.



20 WATT AMPLIFIER: Brand New

Mfd for audio amplifier in Measured Music Systems. Amplifier delivers 15 watts of undistorted audio or 20 watts maximum. Tubes used and included are 2—6L6G; 1—6SN7; 1—6SJ7; 1—5U4. Also 1—6AL5 and 1—2D21 used in remote control circuit. Treble, bass, vernier volume and master volume controls are provided. Sturdily built for continual operation in beautiful gray crackle cabinet 17" x 9¾" x 12½" with carrying handles and key lock cover. Unit is foolproof and trouble free, ideal for use in skating rinks, dance halls, etc. Has Phono and 600 ohm line inputs. Circuit diagram provided with each unit. Original Manufacturer's price on this item understood to be $129.50. Your price, brand new with all tubes, for 110-120 V. 60 cycle operation. ONLY A FEW..... **$19.95** ea.

Can be supplied for 110 V. 25 cycle operation ..... **$5.00** extra



TRANSFORMER PLATE POWER

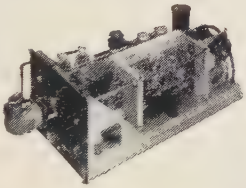
355-0-355 Volts @ 325 Ma. Also 490 V. 325 Ma. Primary 117 Volts 60 cycle. Measures 5" x 5½" x 6". Shipping weight 22 lbs. PRICE **$2.95**

WELDING TRANSFORMER

Tapped Pri. 105-125 volt 60 cy. 1 phase input. 5.1 Volt 190 amp. output. 35 KV RMS insulation test. Case size 7"x10"x12". Ideal for use on spot welder. Wt. 80 lbs..... **$19.95**

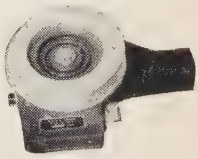
T-39/APQ-9 RADAR TRANSMITTER

Described in Feb. '50 "CQ" for conversion for the 420-450 Mc. amateur band and citizens band. Also contains many parts for the UHF experimenter such as 2—8012 tubes, fan and motor, switches, pots, gears, counter, etc. Equipment removed from aircraft. Our Close Out, quantity limited. **$4.95** ea.



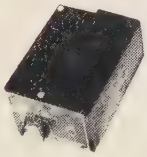
ANTENNA REEL - BRAND NEW

Contains 1/6 HP. 24 volt series motor which may be operated on AC. This motor is the one used extensively for coil winding as it is reversible and contains breaking & disconnect mechanisms. **Only 60 in our inventory.** **$7.95**



PERISCOPE M9 TANK

Heavy steel case Size 1¾" x 6½" x14¾" finished olive crackle. Lenses are precision ground prismatic type reversible and easily removable. These units adaptable in industry for furnace insp., etc. or a nice gift to the kids. Only 120 in inventory..... **$3.95** ea.



CH PRESSURE SWITCH

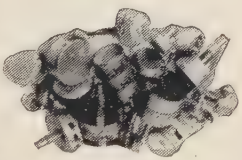
Controls pressure within any setting from 50—250 lbs./sq. in. with a differential of 20—75 lb./sq. in. Use for any motor up to 1 HP. @ 110 V. or 1.5 HP @ 220 V. AC or DC. Has also manually operated push-pull on-off switch Cutler-Hammer Bulletin 9505. BRAND NEW ..... **$1.75** ea.

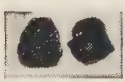
ZENITH COBRA ADAPTER

Play 33 1/3 & 45 RPM records on your old 78 rpm player. Complete with Cobra cartridge & adapter wire & plug. Only 97 in our inventory. New, boxed, **$2.95** ea.

POTENTIOMETERS

Here is a close out of many fine misc. Potentiometers put up in an assortment of 25 to include useful values from 60 ohms to 2 megohms in both wirewound and carbon, with & without switches, singles, duals, & triples, midgets and regular. Possibly no assortment alike so order several. You will save on the need of any one. All brand new controls. 25 for **$2.25**





IGNITION SWITCHES

Aircraft ignition switches for single or twin engines. High current cap. makes ideal switch for model railroaders. Specify choice..... **75c** ea.

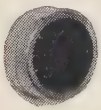
AN-80 ANTENNA

465 Mc. Antenna which may easily be trimmed for amateur use. Easily mounted for mobile use. Includes rubber gasket for rooftop. Matches 52 ohm cable, coax cable fitting included NEW..... **79c** ea.

110 V. AC SOLENOID

New 110 V. AC solenoids with ⅜" dia. steel plunger with ⅜" travel. The terrific pull on this plunger makes it ideal for door locking mechanisms. Only 200 in our inventory. **95c** ea.

MC-254 MICROPHONE



Single carbon Button type microphone made for helmets. Use any place you would use T17 type or other carbon mikes. Size ⅝" thick, 1⅛" diameter. NEW ..... **79c** ea.

ALL MERCHANDISE GUARANTEED. IF NOT SATISFIED, RETURN PREPAID & CASH WILL BE REFUNDED.

ESSE RADIO CO. 40 WEST SOUTH STREET INDIANAPOLIS 25, IND.

Pied Piper

or

To Re-design, or not to Re-design—That is a Question?

C. TIERNEY

I had just rebuilt to a kilowatt and was trying it out when the neighbors' kids started coming in. They came in a rush, struggling against each other at the door. One scrawny boy squeezed through a window. They stood quietly around, looking at me, smiling dumbly.

"Freddie," I said, talking to the oldest, who also lived next door, "you know you can't bring your friends in here." I had taken great pains to make it known that the Ham shack was always off limits to Freddie.

Freddie didn't move. Nobody shifted an inch. "Freddie," I said, with authority, "take your friends outside!"

Freddie just smiled dumbly.

Nothing can be more frustrating than Freddie when he doesn't obey. I never know whether to be a stool-pigeon and tell his parents or just wallop him. As an active amateur in a television community, and looked upon as being a little crazy, it's hard to decide which line of action would get the best results.

I snapped the transmitter off and turned to Freddie and he seemed to wake out of his daze. He shook his head, like he was trying to clear it. The others began shaking their heads. It looked like a chorus of "no" votes. "What am I doing here," Freddie asked with convincing astonishment. "I was in Johnny's yard, looking at his Martian pistol . . . How did I get here?"

I tried to get in on the game. "A couple of orange-faced Martians carried you in."

". . . the next few weeks were hectic . . . kids stood around . . . smiling dumbly . . ."

"Where did they go?" he asked, lookin around the room.

"They said three secret words and disappeare in green smoke." I'd had enough of this juve nile conniving. "All right," I said. "Game's over I'm busy. Go somewhere else and play."

"I was just looking at Johnny's Martian pis tol . . . ." Freddie reiterated, pretending con fusion.

I pointed at the door. "Go!"

The gang left, some still shaking their heads

I turned the transmitter back on and wa watching the needles climb when the kids file back in again.

"Now, look," I said. "Fun's fun. I don't wan to have to tell your mothers." They stoo around with the dreamy look. Suddenly I had strange thought. Fantastic! I remembered tha when I had snapped the transmitter off th kids had come out of their daze. I wondered if the transmitter had some kind of effect on them. Did it draw them from their norma playful pursuits and render them unnaturall quiet in my Ham shack? It was too amazing to believe! But they couldn't be as good actors a they seemed. Anyway, I turned the transmitte off just to see what the results would be.

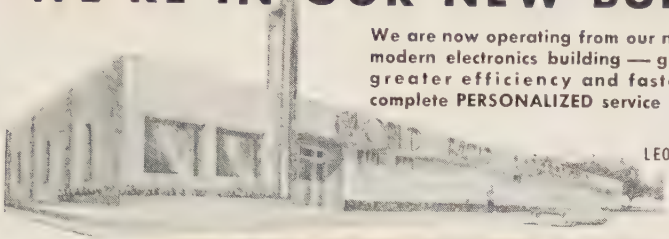
All the heads went "no" again. Suspicion crept on some faces as they began to realize they were in the Ham shack. One large boy looked at me with arrogant distaste as Freddie again led the bunch out of the room.

I've given the problem some thought since then, and I remember reading somewhere about oscillations that attracted birds and other animals. Perhaps I had a strange oscillation in my rig, pitched so high as to be imperceptible to the ears of everyone but little children. Fate through some fantastic trick, had turned my new transmitter into a modern pied piper.

The next few weeks were hectic. Every time I turned the rig on kids came in and stood around, their small red, cherubic faces, smiling dumbly. Neighbors complained. One threatened to write his congressman about the devilish machine I had concocted. He claimed it was Bolshevik inspired and should be investigated

(Continued on page 54)

WE'RE IN OUR NEW BUILDING!



We are now operating from our new ultra-modern electronics building — geared for greater efficiency and faster, more complete PERSONALIZED service than ever.

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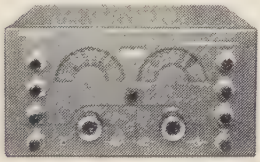
NC-183 D RECEIVER

Dual conversion on the three highest ranges plus every feature you want in a truly modern receiver!

(Less Speaker). $383.50



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HRO-60 RECEIVER

with AUTOMATIC DUAL CONVERSION

Less speaker.. $533.50

$29.08 (18 MONTHS)

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Now Available . . . NEW NC-88

only $129.95 with Built-in Speaker

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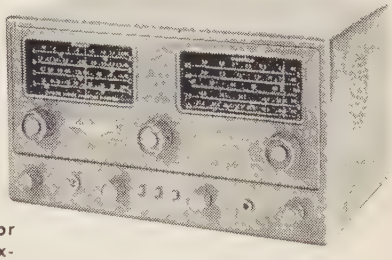
$13.00 CASH DOWN



A top-notch value for both the novice and experienced amateur! Compare these features: Calibrated band-spread for 80, 40, 20, 15, and 10 meter bands. Advanced A.C. superhet circuit uses 8 high gain miniature tubes plus rectifier. Covers 540 kcs. to 40 mcs. in 4 bands. Tuned R.F. stage — two I.F. stages — two high-fidelity audio stages with phono input and 2-position tone control. Built-in speaker. Antenna trimmer — separate high frequency oscillator. R.F. gain control. Series valve noise limiter. Delayed A.V.C. Headphone jack. And, send-receive switch.

CHECK OUR GENEROUS ALLOWANCES
WE NEED MORE TRADE-INS

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MODEL NO.	12 MONTHLY PAYMENTS	CASH DOWN	CASH PRICE
NC-125 RECEIVER	$15.89	$20.00	$199.95
SW-54 RECEIVER	3.97	5.00	49.95
SELECT-O-JET	2.29	2.88	28.75
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SPEAKER FOR HRO-60 OR NC-183D $16.00

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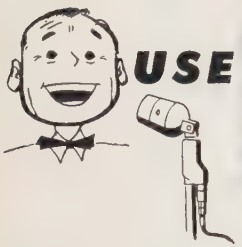
TO MAKE A GOOD RIG BETTER



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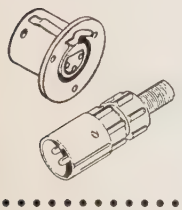
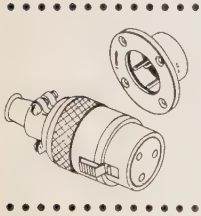
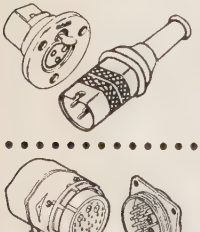
ABC, NBC, CBS and all radio and TV stations have used Cannon Plugs almost exclusively since they started . . . You can have the same high quality and dependability that spell satisfaction . . . in rig building *and* operation.



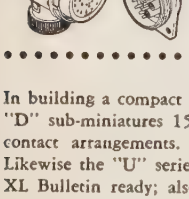
XL SERIES. With *thumb pressure* LATCHLOCK—no accidental disconnect. Mike and audio connector; 3 or 4 contacts, seventeen complete assemblies. Standard on top quality mikes. Available through most radio jobbers.



P SERIES. The old faithful—radio men swear *by* it, not *at* it. *Thumb pressure* LATCHLOCK, positive connection. Up to 8 contacts; steel plug shell. Ninety-nine complete assemblies for audio circuits and power.



UA SERIES. The RTMA specified standard, weatherproof; gold plated contacts, spring insert removal. *Thumb pressure* LATCHLOCK.



K SERIES. For power supplies, audio circuits and combined circuits. A great variety of shells and inserts.

In building a compact rig, look into the new "D" sub-miniatures 15, 25, 37, and 50—5a contact arrangements. They're *really* small. Likewise the "U" series—1-12 contacts. New XL Bulletin ready; also ask for RJC-6 with prices and list of our franchised distributors.

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ZERO BIAS . . .

(from page 11)

dition, leaders of Respondent sought to establish this system in such a manner as to avoid detection by the Federal Communications Commission of illegal transmissions."

Foreign Relations Committee's Interest

In the second place, in free countries throughout the world, Communists have been discovered operating clandestine radio equipment in connection with their espionage and revolutionary activities.

I have had the Counsel for the Senate Foreign Relations Committee, (on which Committee I am privileged to be Chairman) explore the international phases of this problem, and he has readily confirmed its serious world-wide implications and has been in touch with our authorities at my direction accordingly. His activity arises particularly in connection with the work of our Security Affairs sub-committee on which I am also Chairman.

The next question is: Is Senator Wiley alone in raising this security problem? The answer again is, of course not.

Long before I had publicly raised the issue, it had been considered independently by the FCC and by alert security agencies of the United States Government—who are and have been considerably troubled about it. These agencies are right now considering all phases of the problem.

Officials of the agencies are, of course, fully aware of the patriotic record of Hams. The officials do not want unnecessarily to interfere with the vast number of Hams or to get into some new bureaucratic red-tape requirement as such, if it can be possibly avoided, or to do anything which might be unjustified under the circumstances.

Well then, what is Senator Wiley's role in this problem? Basically, what I personally have done is to urge the FCC and the security agencies to expedite their own careful review so that the study does not drag on endlessly.

I have done so in my capacity as Chairman of one Committee and its expert sub-Committee and as Ranking Majority Member (and former Chairman) of another Committee — Judiciary — whose jurisdiction includes America's internal security.

If some sound steps can be taken to assure further U. S. security—after full consultation with "Ham" leaders, themselves, obviously every patriotic Ham will welcome such steps as, I am sure "CQ" will.

Do you believe that any patriotic Ham would adopt a line of thought to this effect:

> "Gentlemen of the Federal Government, don't raise any security question, as regards Hams. Never mind if some few Communists misuse amateur radio. Just ignore the problem; let the security problem take care of itself?"

Of course not. Such a line of thought would be ridiculous and reckless. The security problem will not take care of itself; every patriotic Ham particularly veterans of our Armed Forces and experts on Communism—know that fact full well.

Every loyal Ham is eager to cooperate further with Uncle Sam in whatever actions prove genuinely necessary to assure our very survival against this international Communist conspiracy.

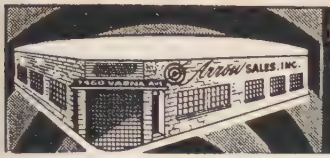
And so, I hope that this description of the background of my comments clears up any doubts on the matter. I have in summary, offered no "packaged solutions." I have merely publicly raised the problem and urged prompt consideration of all its phases.

Lastly, in my own State of Wisconsin—there are many exceedingly active Hams with whom I have been in close touch on many occasions and whom number, I am sure among your most interested readers.

They, like Hams throughout our nation will fully support patriotic efforts—by myself or anyone else—to make sure that the Communists are not permitted to besmirch the honored name of American amateur radio operators. With all good wishes, I am

Sincerely yours,
Alexander Wiley
U.S. Senate

(Continued on page 52)



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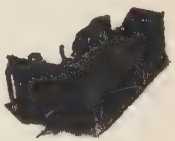

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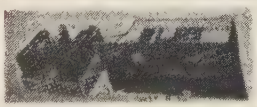

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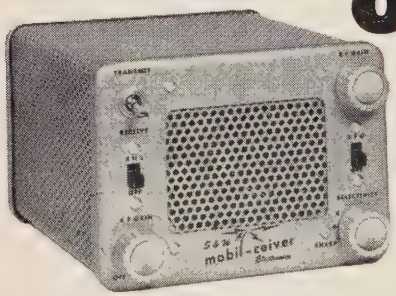

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(from page 50)

The following letters are literally samples of the many received at the CQ office in response to the January editorial. Some of them are carbon copies of letters sent directly to Senator Wiley while others are copies of letters to the ARRL.

Dear Senator:

. . . From my own experience in times of emergency would like to say that as far back as 1933 helped in landing a plane lost in fog and more recently was able to assist to a small degree in the Virginia Forest Fires of two years ago, and November 1952 was able to send valuable assistance in the Kingsport, Tenn. snow storm emergency; also as recent as last October was able to help get an urgent message into the Polar Regions to a Polar Expedition (see page 34, **Boston Sunday Post**, October 4, 1953). In another instance several years ago was able, with knowledge of the code, to flash a message with my car lights to a plane lost over this area and about out of gas and direct it to an airport ten miles from here. Also due to my radio experience was able to teach radio at an Army Signal Corps School during first two years of World War II.

These are a few of my own personal experiences in being able to help my Country with amateur radio and, of course, I am only one of many thousands of radio amateurs in this country.

. . . I think that the newspaper article gave Ham radio a black eye in the public mind as most average citizens know very little of amateur radio operations and same might cause poor cooperation of the general public with radio amateurs during an emergency and if there is some way you can re-establish any confidence you may have caused to be lost by the public in amateur radio, you should by all means do so at once.

Evidently you have been badly misinformed by persons who either are completely ignorant of the facts or are enemies of our Country and might bear some investigating themselves . . .

Wilbur Jackson, W4AVR
Chatsworth, Georgia.

Editor, CQ:

I think I can say thoughtfully that, had it not been for the lowly Ham, our country would have lost more men and won less battles in either World War I or World War II. I also feel quite sure our Armed Forces sanction the Ham operation as a training program which costs the government nothing.

It might be well to advise the good Senator from the dairy land state that in the event he wishes to get a message to any place in the U.S.A. or, as a matter of fact, to any place on earth where we lowly Hams are permitted to QSO, after all other means of communication have failed (telephone and telegraph), he needs merely to give it to a Ham and he'll get it through . . . many of them have stand-by power plants for just such emergencies as floods, fires, earthquakes, and any other disaster that might occur. We also might add that no one pays one cent for all of these facilities but the Ham.

M. H. Goodnough, W6KYY
Yucca Valley, Calif.

Editor, CQ:

I am writing this in regards to your fine editorial in January '54 "Zero Bias." It seems to me, as you said, that it is time for us to say something now and to uphold the rights of the national fraternity of Ham radio . . . I do not know to what extent is Sen. Wiley's knowledge of Ham radio, but I do believe that if he could obtain a license, or even get hold of an S-38 and listen for a week and then talk to fellow Hams, he would agree wholeheartedly that this is an organization to uphold and be proud of not doubt.

Tom Jones, WN8OJE
West Richfield, Ohio

(Continued on page 53)

Editor, CQ:

. . . since the American Radio Relay League is the official representative of the total amateur society, I feel that all amateur members of the League should be informed of that charge which has been presented and leveled against them—and should be well represented in showing that the philosophy that motivated that charge is riddled with fallacy . . . I am sure that all other amateurs would be also most ready to defend their patriotism and loyalty to their country with a few facts—and believe that if possible the League should inform them of the slam to which they have been made a victim.

With a sincere hope that Sen. Wiley will become, as stated in the article in CQ, better informed as to the amateur society of the U.S., I am,

Patrick F. Wilson, W7UNR

Spokane, Wash.

Editor, CQ:

I fail to see your monumental concern.

Our elected legislators, I trust, have the interest of the people of the United States at heart and are in a better position than you or I to judge what will best serve that interest.

All good patriots have nothing to fear. "Basic rights" are subservient to public interest as long as man elects to be socially organized and governed . . .

Nor would your extremely forward-looking, and hence unlikely, thought of "minute surveillance" which would "result in final curtailment of all Ham privileges" be too great a sacrifice, if thought necessary, although, of course, it might lose you your job.

Phyllis D. Foss, W2BQX

Englewood, N.J.

Editor, CQ:

Does he (Wiley) realize that in almost every laboratory and in all the services you find amateur radio operators? Or is he one that says, since one is wrong, all the apples in the barrel are bad?

Pvt. Ronald J. Wanat, W9MRC/7

Ft. Lewis, Wash.

Editor, CQ:

. . . taken literally—of course, your timely "Zero Bias" article doesn't emphasize sufficiently the fact that these remarks by Sen. Wiley, however inaccurate, cast that certain shadow of doubt—an insinuation which in itself is tremendously more than a "mere stain" on the reputation of the whole amateur fraternity . . . We feel rather than see the "mailed fist" of commercial interests whom, in our ever growing activities, are feeling pressure because of our existence, whether commercial communication or entertainment channels and possibly even more so, the television manufacturer. The latter can easily feel our suggested improvements of their wares to be unnecessary could we but be eliminated—particularly when an apparently "casual" inference might easily snowball into a terrific proportion. Here indeed is an attempt at little short of "legal murder."

I have been an amateur . . . for 34 or 35 years. It was we who brought to the attention of the rest of the world the possibilities of the frequencies above our present broadcast band. While not too willingly at times, we have released, traded or have had stolen from us all but our present segments of frequencies. In but one instance—our new 21-Mc. band—we have lost ground consistently. Expansion of service facilities and improving long-range communications requirements have made this subdivision an admitted necessity. This "new move," however, has none of the earmarks of the efforts preceding those above-mentioned changes . . . This is the trade-mark of a . . . mind intent upon destroying rather than borrowing from the radio Hams.

Hal C. McCracken, W7WJ

Portland, Oregon

(Continued on page 54)

2 METER OR 220MC CONVERTER

Now you can receive 220-225MC or 2 meters on a conventional Short Wave Receiver. Especially designed Push-Pull 6J6 R. F. Amplifier into 6J6 Oscillator-Mixer. Balanced line input, coaxial output. All slug tuned adjustments, high quality components. Output frequency is 21 to 25 MC. Highly stable oscillator.

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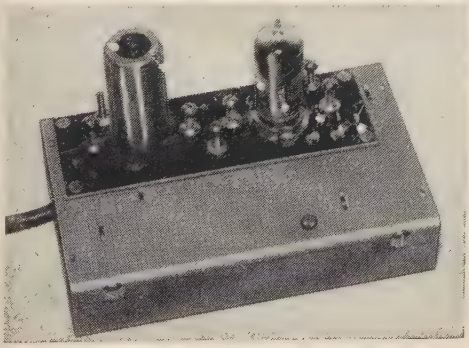
FOR ADDITIONAL DETAILS REFER TO "VHF-UHF NEWS," DECEMBER, 1953, CQ—PAGE 32.



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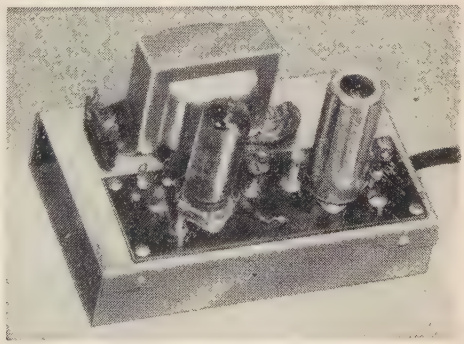

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(from page 53)

Editor, CQ:

. . . seems that all the good value of the "Ham World" is being forgotten.

Joseph O. Szempias, W8JKB
Toledo, Ohio

Editor, CQ:

As for security . . . previous to the summer of 1953 all broadcast stations were required to employ duly licensed operators. These operators had to prove citizenship, birth and allegiance. Today a great majority of the stations are allowed the privilege of operating with so-called "permits."

These "permitees" can obtain a permit merely by giving their name, address and age to the management of the radio station who in turn submit this meager information to the FCC. In a matter of a week or ten days a permit is sent through the mail without any form of examination or question as to character, ability or allegiance to this country.

When Senator Wiley speaks of security let's know the true facts. Frankly, in my book it doesn't seem to rest at the doorstep of the Hams.

Chief Engineer KSIG, W5BEM
Crowley, La.

Editor, CQ:

I had decided not to renew my subscription to CQ, but your editorial in January CQ changed my mind.

More power to you when you are fighting not the amateurs but their battle.

Hamlin C. King, W8EQN
Springfield, Ohio.

Hon. Lyndon B. Johnson
My dear Senator:

. . . If Congress should see fit to restrict amateur activities under the guise of "security" we would soon find ourselves on an electronic par with the Soviets and this is not a pretty picture. Through amateur channels we have learned that there are fewer than six hundred individuals holding amateur radio station licenses in the Soviet Union. This represents fewer tha nthe total number of Soviet licenses in effect during the year 1939 and certainly does not speak well for the pool of skilled, practical technicians available to the Soviet military. A fair measure of the type of democracy practiced by any government is the ratio of amateurs to total population.

James M. Price, W5FXN
Austin, Texas

PIED PIPER

(from page 54)

I tried to shield the final, and caught a troop of Boy Scouts marching to a camporee. The Scoutmaster stood red-faced in the street, shouting chastisements at the deserters.

I went to work changing all the components in the final, blindly hoping to get rid of the oscillation. Children, dressed as cowboys and spacement, left their mothers' hands at the sidewalk. I broke up one little girl's birthday party, and the whole gang came in with cake on their faces, one little boy dragging a cat by the tail.

Freddie was helpful in making tests. I bought his help only after he held out for large quantities of chocolate candy. I can see him even now, chocolate dripping from his greedy little hand while his blank face stared at nothing. More than once I thought what a boon it would be if I could discover the principle and create an

instrument that would keep Freddie quiet like that when I wanted him to be.

And then one Sunday evening, after a very tiring afternoon of rewiring, during which time I had broken up a Sunday School class and disrupted a child's recreational center in the Park around the corner, I licked the problem. It had cost me a week of spare time work, three 304TL's that Freddie broke and an assortment

". . . there were dogs out there . . . ten or twenty of them . . ."

of chokes, resistors and condensors that had fallen victims to my unpredictable temper. But it was worth it when I turned on the rig and Freddie continued to chew his candy in a normal, wiggly manner.

After supper, I went into the shack looking for some DX. Excitement raced in my blood. I fired up the kilowatt, confident that all the little ones would stay safely ensconced in their beds. I had just called CQ when I heard a strange pattering outside. "Oh no!" I thought. "Not kids again!" I sneaked to the window and peered out. There were dogs out there. Ten or twenty of them. And they all had that glazed, dumb look in their eyes that the kids had had.

"Nuts to it," I said, and called CQ. Even when the dogs started baying, I didn't care. When some of the fellows complained about the strange howling QRM, I didn't care. I wanted to work that new rig! I contacted a friend ten miles away. He swore he heard the dogs howling, even when I wasn't transmitting. But, like I said, I just didn't care anymore!

LOW-PASS FILTER

(from page 26)

1000 c.p.s. will be noted. The switch provided allows the filter to be ready for use at any time even though it is not used continuously. A simple turn of the knob can save many a QSO from the unexpected appearance of an interfering signal.

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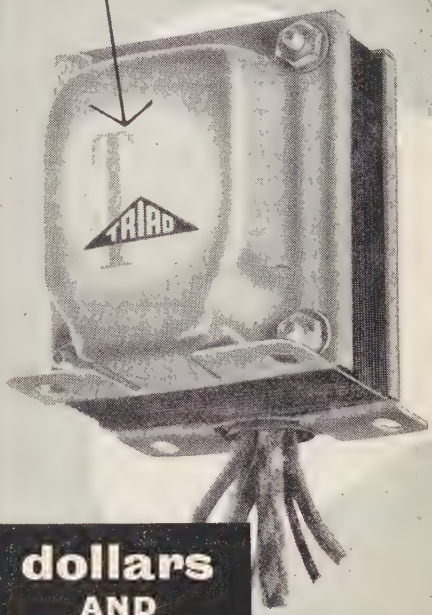

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S202T—Std. 20m 2-El. T match, $24.95. 1—12' Boom, 1" Alum. Tubing; 2—12' Center Elements, 1" Alum. Tubing; 4—12' End Inserts, ⅞" Alum. Tubing; 1—T Match (8'), Polystyrene Tubing; 1—Beam Mount.

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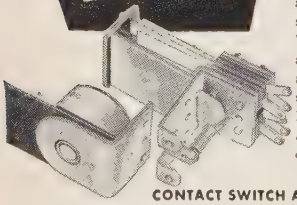


Interchangeable **COIL and CONTACT SWITCH ASSEMBLIES** *Save Time—Cut Costs!*

★ Coil assembly includes coil and field piece. Contact assembly consists of switch blades, armature, return spring and mounting bracket. Standard and Midget contact assemblies in either S.P.D.T. or D.P.D.T. are *interchangeable* and can be used with any of 13 coils described below.

CONTACT SWITCH ASSEMBLIES

CAT. NO.	TYPE		COMBINATION	
200-1	Standard	8 amps	Single Pole	Double Throw
200-2	Standard	8 amps	Double Pole	Double Throw
200-3	Standard Contact Switch Parts Kit with complete assembly and wiring details			
200-4	Standard	12.5 amps	Double Pole	Double Throw
200-5	Standard	8 amps	Four Pole	Double Throw
200-M1	Midget	8 amps	Single Pole	Double Throw
200-M2	Midget	8 amps	Double Pole	Double Throw
200-M3	Midget Contact Switch Parts Kit with complete assembly and wiring details.			

13 COILS ASSEMBLIES

A.C. COILS* CAT. NO.	VOLTS	D.C. COILS CAT. NO.	VOLTS
200-6A	6 A.C.	200-6D	6 D.C.
200-12A	12 A.C.	200-12D	12 D.C.
200-24A	24 A.C.	200-24D	24 D.C.
200-115A	115 A.C.	200-32D	32 D.C.
		200-110D	110 D.C.
		200-5000D for current type	

*All A. C. coils available in 25 and 60 cycles

GUARDIAN ELECTRIC

1604-C W. WALNUT STREET CHICAGO 12, ILLINOIS

A COMPLETE LINE OF RELAYS SERVING RADIO AMATEURS

COMMENTARIES

(from page 22)

Appendix

Elongated, small-diameter, helix antennas, such a described by W2EUQ, usually radiate somewhat be ter than an unloaded wire the length of the heli However, the improvement comes only incidental from the inductance of the helix. It is the adde capacity that does the trick.

A metal tube the same length and diameter as th helix, resonated to the operating frequency with high-Q loading coil, as in mobile whips, will be still-more efficient radiator. The greater the diamete of the rod or the longer it is (up to a self-resonar length), the better the system radiates, because les of the r-f power is dissipated as heat in a smalle coil. Commercial installations on small boats fre quently use two rods, spaced a short distance apar and connected in parallel, to increase the effectiv capacity of the antenna, thus reducing the size of th loading coil required.

The long helix is relatively inefficient for thre reasons: (1) Wood, especially when out in th weather, does not make a low-loss coil form. (2) It extremely poor form factor (length/diameter) neces sitates much more wire to obtain the desired induc tance than would be required in a coil of optimum dimensions. (3) Heavy currents flow in any short ened antenna, and the small wire used to wind i results in high IR losses.

The entire field of shortened antennas is a fertil one for experimentation. Those who care to wor with them may be interested in the idea of wrapping a bamboo pole lengthwise with aluminum foil t obtain a light-weight rod of fairly high capacity. Foi designed for preserving food (*Reynold's Wrap*, etc. comes in long rolls and works fine in this applica tion—*Editor*.

VK1 STORY

(from page 17)

ern polar regions Antarctica is a land covered with ice and snow. The north is mainly ice. Large, untapped resources of marine proteins and fats in whales, seals, fish, plankton and birds also offer food for the future.

The region is not locked in frozen slumber. Gigantic smouldering volcanoes have been seen and extensive regions devoid of ice. What do these areas hold? Only the future will tell.

In all MacRobertson Land Antarctica is a land of potential wealth and the men that man the station are hoping to find it.

VK1 has earned for itself a niche in the hall of amateur radio fame, first at Heard Island then at Macquarie Island and now at Mac Robertson Land. May these men long be spared to talk to us from "down under."

What's New In Ham Radio

(Continued from page 44)

the **6360** is a miniature 832, capable of delivering 16 watts at 200 Mc., and 5 watts as a frequency tripler to 200 Mc.! The **6360** has an oxide-coated, indirectly heated cathode, and is particularly suitable for use in low-drain mobile transmitters and multiplier chains where its ability to increase the power level quickly and to deliver a balanced output makes it ideal for driving higher power and higher frequency stages. Sounds like the ideal tube for a 2-meter mobile transmitter, doesn't it? For further information on the **6360** write to **AMPEREX** Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.

When two Hams such as Messrs. **BARKER** and **WILLIAMSON** put their heads together and come up with a new idea, you can bet it is a real item for the Ham! Here's their latest: **The 1-kilowatt Baluns.**

Three different **Baluns** are now on the market. They are designed to match an unbalanced 75-ohm line (such as RG-11/U) to a 100 ohm "T" match section—just the ticket for a rotary beam! They are available for either 20, 15 or 10 meter operation, and will really take the guesswork out of impedance matching problems!

Another basic type of **Balun** being marketed is for use with half-wave folded dipole antennas. 5 models are available of this type, for matching a 75-ohm unbalanced line to a 300-ohm dipole for operation on 80, 40, 20, 15 and 10 meters.

The **Baluns** are built in weather-proof boxes and require no adjustment, except for the normal adjustment of the "T" section. Each **Balun** is fitted with a coaxial input terminal and ceramic output terminals.

Write to **B&W** and ask for **Bulletin 700.** The QTH: **BARKER AND WILLIAMSON,** Inc. 237 Fairfield Ave., Upper Darby, Penna.

It is well known that a good DX man can hear two wires scraped together in Outer Tannu-Tuva. It is a rare DX man, however, who hears the scraping on a loudspeaker! Invariably, the DX man (or any serious amateur for that matter) has a good pair of sensitive, light, headphones, ready for serious Hamming.

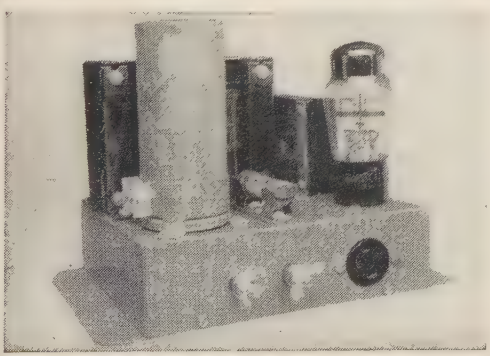
A recent development of **TELEX,** Inc. is the new **Twinset.** Weighing only 1.6 ounces (how much do your 'phones weigh?) the **Twinset** features a new method of sound reception. **Twinset's** two receivers rest on the temples, and the actual sound is piped directly into the ear through a slender, tubular sound arm, mounted on a ball-and-socket joint. A single cord replaces the

cumbersome "Y" cord found on old-fashioned 'phones.

The two receivers are matched and properly phased for maximum sensitivity. The unit is fully adjustable, and the ear tips may even be adjusted to rest a fraction of an inch away from the ear. If you came out of the recent DX contest with a deep groove across the top of your head from your "light weight" earphones, better look at the **TELEX Twinset** at your nearest electronics supply house! For literature and price information write Dept. KP, **TELEX,** Inc., Telex Park, St. Paul, Minnesota.

Now Available . . .

MOBILE POWER SUPPLY KITS



- Power Supply for mobile or marine transmitters
- Designed by mobile equipment engineers
- High efficiency with lower battery drain
- Output 500 volts filtered d.c. at 225 ma.
- Does not require high current switching
- Instant start and stop. No waiting for voltage buildup or coasting down as in rotary equipment.
- No battery drain while on receive or standby
- Special heavy duty communication type vibrator for dependable long life.
- Properly designed filter assures very low ripple
- Fully detailed assembly and wiring instructions with each KIT
- Small, compact, rugged construction

6-volt input **$29.50** 12-volt input **$31.50**

Nothing else to buy—these KITS include all hardware, pre-punched chassis and base, rectifier tube, heavy duty vibrator, etc. for immediate shipment.

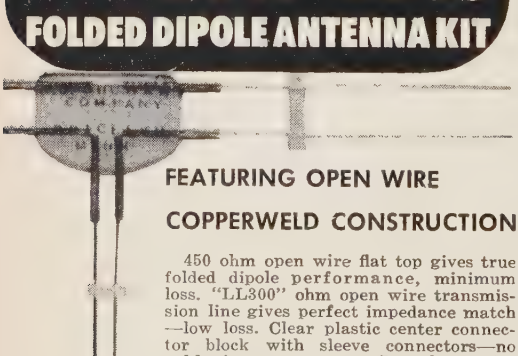
PALCO ENGINEERING, INC.

150 West 75th Street **Indianapolis, Indiana**

No Sahib, you won't find any white elephant merchandise at ALLIED

. . . if you're looking for some white elephants, we suggest you shop around in Thailand, but if you want top-quality Amateur equipment, then your best bet is Allied. At Allied, you'll never find "white elephant" merchandise, but only first-rate Amateur equipment carefully appraised by our staff of experienced Amateurs. Allied stocks the finest and most complete lines of famous-brand Amateur equipment—there's Hallicrafters, Hammarlund, National, Collins, Johnson, Barker-Williamson, Harvey-Wells, Gonset, Eldico, Babcock, Elmac, and all the other famous brands that mean dependable, more enjoyable Amateur communications. So remember, whether you're interested in mobile or fixed-station work, whether you prefer phone or CW, whether you're an OT or just received your WN call, you'll enjoy the best in equipment, convenience and service by ordering from Allied. And of course, our Easy Payment Plan makes it easy to buy without putting any strain on the budget. If you don't yet have our 268-page Catalog, by all means get yourself a copy. Just drop a card to Allied Radio Corp., 100 N. Western Ave., Dept. 16-C-4, Chicago 80, Ill.

MAKE YOUR SIGNAL OUTSTANDING WITH A LOW LOSS FOLDED DIPOLE ANTENNA KIT



FEATURING OPEN WIRE COPPERWELD CONSTRUCTION

450 ohm open wire flat top gives true folded dipole performance, minimum loss. "LL300" ohm open wire transmission line gives perfect impedance match —low loss. Clear plastic center connector block with sleeve connectors—no soldering necessary. Low loss polystyrene spacers on both flat top and transmission line. Low wind resistance —copperweld construction guarantees long life. 6 models—50′ to 250′ transmission line lengths.

YOU GET ALL THIS . . .

Roll of 300 and 450 ohm open wire transmission line . . . 1 thermoplastic center connector block . . . 2—4″ porcelain end insulators . . . complete instructions.

WRITE TODAY . . . or send QSL card, attention WØTJF, for FREE folder—specifications and prices.

Manufactured and Sold By:
R. J. BUCHAN CO.
BRICELYN 5, MINNESOTA

NOVICE SHACK

(from page 35)

postmarks, and it is protected from the weather. I undeliverable. it will be returned to you, if yo place your return address on the envelope.

Put a complete address on all cards sent. "Ama teur Radio W9EGQ, Gary, Indiana," is not sufficient even in a fairly small town. In a large city, it i the address of the Dead Letter Box.

If you do not get results from your first card, sen another one after a reasonable time. The first on may have gotten lost in the mail or been mislai before it could be answered. Including a courteou note with the second card, explaining why you woul appreciate an answer, will usually help.

Undoubtedly, most amateurs fully intend to answe all cards received. The trouble is that some of u put off doing so and end up forgetting to answe some of them. The obvious solution is to answer all cards promptly. If you do not have formal QS cards, use a postal card. Don't worry about what the recipient will think of such a card; think of his opinion of you if you ignore him entirely.

Confirming Foreign Contacts

Most foreign amateurs do not QSL U.S. amateurs until they receive their cards, because they get so many U.S. cards. Therefore, you will have to make the first move. If you cannot find the addresses of any foreign stations you may work in the *Call Book* or in the monthly lists of addresses appearing in KV4AA's *CQ* DX column, you may send the cards in care of their QSL bureaus. The address of each country's QSL Bureau heads that country's list of amateur addresses in the *Call Book*. The disadvantage to sending QSL cards through the bureaus is that it is usually much slower than sending cards directly.

Postage for cards sent to foreign countries is four cents. Eight cents for letters or cards in an envelope. Rates to U.S. possessions are the same as in the continental United States.

A large percentage of incoming foreign cards come through the *ARRL QSL Bureaus*. To get yours you must keep a stamped envelope on file with your call area *QSL Manager*. His address is listed in the *Call Book* at the head of each Call Area listing and in every other issue of *QST*.

The envelope should be about 4¼ x 9½ inches. Put your name and address in the normal place and your call letters in the upper left hand corner of the envelope—the place usually reserved for the return address.

Do not send outgoing cards to your QSL Manager for forwarding.

Letters And General News

Of special interest to prospective amateurs studying for their first FCC license and Novices studying for a Technician or General Class License is the new **AMECO Radio Amateur License Guide.** This 32-page booklet contains practice questions covering the scope of the FCC written examinations for the Novice, Technician and General Class licenses. Each question is followed by four answers from which the student selects the one he believes to be correct. Typical FCC examinations for the various licenses, are also given so that the student can determine just what he must know to obtain a license. These typical examinations are also accompanied by multiple-choice answers, just as in the actual examination. Answers to all questions are given in the back of the booklet.

The License Guide sells for fifty cents and may be

obtained from most amateur supply houses or from **American Electronics Co.**, 1203-05 Bryant Ave., New York 59, N. Y.

Tom, **WN4BXV**, Quitman, Georgia, writes a newsy letter. "Dear Herb, Here I've been on the air 79 days and haven't written you yet—so here goes. With a **Philmore** NT-200 transmitter and a **Hallicrafter** S-38C receiver, I have worked 28 states, with 24 confirmed. Best DX has been 1400 miles. Although I run only 20 or 25 watts, I have been the first Georgia contact for several Novices. Of 120 QSL cards sent out, I have received 101. My 3.7-Mc. antenna is end-fed, 130 feet long and 40 feet high, and the 7.2-Mc. one is end fed, 65 feet long and 23 feet high. . . . Now to get down to something I've had on my mind. I wish the FCC would catch some of those fellows who hold their keys down for fifteen minutes at a time without signing their calls. I hope to have a few more calls booming out of Quitman soon. One of them will belong to my 'Bugology' teacher."

Leonard Ross, **WN6SJR/W6SJR**, writes, "Dear Herb, I passed the technician examination on September 13, 1953, and am now the country's youngest technician licensee (Age 8). I failed the General class code test a few weeks ago, but I can now copy 148 letters straight at fifteen words per minute. I would like to buy a 300-watt, **14-Mc. rig.**"

Tommy Phillips, **WN3WST**, gets right to it. "Dear Herb, "With my borrowed 6L6 Army **surplus** rig and an S-38C receiver, I have had 230 contacts in sixty days of operation. I have worked 37 states, two Canadian provinces and Puerto Rico, and I have confirmations from all but three of the states. Power is 45 watts, and my antenna is a cramped, end-fed long wire. At present, I am making a stab at **WAS**, but those dog-gone WN7's must have closed down their shacks. I have made most of my contacts in the morning, because of the 'one-eyed monster'—TVI."

Fred, **WN4CHK**, says, "Dear Herb, I have been on for about nine weeks and have worked 33 states and Puerto Rico, all confirmed. My transmitter is a 6V6 oscillator into a 6L6 amplifier, running about 22 watts input, feeding a 135-foot doublet, fifteen feet high. The receiver is an old SX-18. I am looking for contacts with Rhode Island and Vermont, the only two states east of the Mississippi that I have not worked. My frequencies are 3725 kc. and 7186 kc."

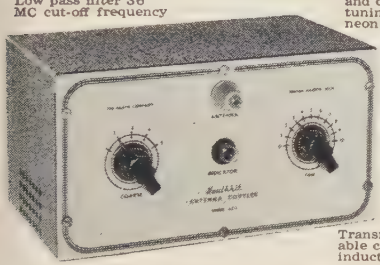
About Roger, **W8OMB**, Grand Rapids, Mich. A few weeks ago, Roger stopped in to see me on his way home from taking his General Class examination in Chicago. Last week, he called me on 75-meter phone with his new 300-watt phone rig. The FCC took only five days to issue his new license!

From Larry, **W5WRW**, "Dear Herb, No, I am not now a Novice, but those good ol' days are not real far behind, hi. I'd just like to let the fellows who would like a Texas QSO for their WAS—a QSL guaranteed—know that I'm on 80-meter CW on weekends between 0300 and 0600 CST. I like to work Novices and am glad to QRS (send slower) if necessary. I only run 20 watts input on 80 meters, but I've worked 35 states on 80, the rest on 40. I also worked a WH6 (Hawaii) on 80. That was my biggest thrill. So I'll be looking for the boys and girls some weekend."

(Continued on next page)

Low pass filter 36 MC cut-off frequency

Inductance and capacity tuning—neon indicator



52 ohm input coaxial —up to 75 watts input power

Transmitting type variable condenser—tapped inductance.

MODEL AC-1 ANTENNA COUPLER

The new Heathkit Antenna Coupler, Model AC-1 was specifically designed to operate with the Heathkit Amateur Transmitter and will operate with any Transmitter not exceeding 75 watts RF input power.

RUGGED DESIGN has resulted in a sturdy, well-shielded unit featuring a copper plated chassis and shield compartments. A coaxial 52 ohm receptacle on the rear of the chassis connects to a three section, Pi type low pass filter with a cut-off frequency of 36 MC.

TUNING NETWORK consists of a variable capacitance and tapped inductance in an impedance matching unit.

CAPACITY COUPLED neon lamp serves as a tuning indicator and will also provide a rough indication of power output.

$14.50

SHIP. WT. 3 LBS.

Heathkit ANTENNA

IMPEDANCE METER KIT and ANTENNA COUPLER KIT

MODEL AM-1 IMPEDANCE METER

The Heathkit Antenna Impedance Meter is basically a resistance type standing wave ratio bridge with one arm a variable resistance. In this manner, it is possible to measure radiation resistance and resonant frequency of an antenna, transmission line impedance, approximate SWR and optimum receiver input.

USE IT ALSO as a phone monitor or as a field strength meter where high sensitivity is not required.

FREQUENCY RANGE of the AM-1 is 0-150 MC and range of impedance measurement 0-600 ohms. The circuit uses a 100 microampere Simpson meter as a sensitive null indicator. Shielded aluminum, light weight cabinet, strong, self-supporting antenna terminals.

$14.50

SHIP. WT. 3 LBS.

Match transmission lines for minimum SWR

Contact light weight completely portable

Determine antenna resistance and resonance

Strong, self-supporting antenna terminals

HEATH COMPANY

BENTON HARBOR 6, MICHIGAN

mark I

High sensitivity and performance are featured in this beautiful 'S' meter by PHALZ. The unit comes in a combination red anodized and gray hammertoned cabinet (2" x 3½" x 6") with all controls panel mounted. The Mark I 'S' meter is completely wired and tested and is easily installed (can replace tuning eye). Price $19.95 FOB, Glendale, California.

mark II

The Dual Unit Mark II combines the Mark I and Mark III in a 2½" x 4" x 10" cabinet strikingly finished in semi-metallic blue anodizing combined with gray hammertone. Veri-colored meter dials (featured on all units) have black backgrounds for easy readability. Priced at $49.95 FOB Glendale, Calif. Write directly to: PHALZ ELECTRONICS for information — Enclose 15% with order, balance C.O.D.

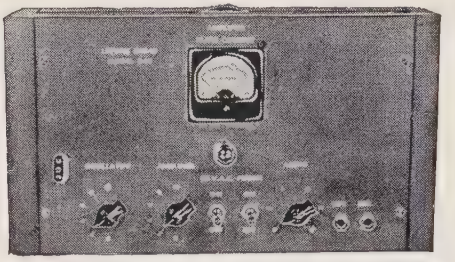
mark III

The direct reading Mark III modulation monitor accurately indicates the efficiency of your modulator expressed in percentages. Also shows overmodulation. The unit is easily coupled to transmitter, and is available as a companion to the Mark I in identical red anodized and gray hammertoned cabinet. A handsome and practical accessory at only $29.95 FOB, Glendale, California.

PHALZ ELECTRONICS COMPANY • 3905½ SAN FERNANDO ROAD • GLENDALE 4, CALIFORNIA

BUY OF A LIFE TIME!

TRIED AND PROVEN THE WORLD OVER



LETTINE MODEL 240 TRANSMITTER WITH MOBILE CONNECTIONS AND A.C. POWER SUPPLY

This outstanding transmitter has been acclaimed a great performer throughout the world. It is excellent for fixed station, portable or mobile operation. Air wound plug-in coils used for greater efficiency—never obsolete—an outstanding buy, direct from our factory, ready to operate.

The 240 is a 40 to 50 watt Phone-CW rig for 160 to 10 meters, complete with: (8 x 14 x 8) cabinet, self contained A.C. power supply, MOBILE connections, meter, tubes, crystal and coils for 40 meters. Tubes: 6V6 osc., 807 final, 6SJ7 crystal mike amp., 6N7 phase inverter, 2 6L6's mod., 5U4G rect. Weight 30 lbs. TVI instructions included. 90 day guarantee. Price **$79.95.**

LETTINE VFO & ANT. TUNER NOW IN STOCK

$25 deposit with order—balance C.O.D.

80, 20, 10 meter coils $2.91 per set. 160 meter coils $3.60. Also for CAP, Broadcast, MARS, Marine, State Guard, Novice.

LETTINE RADIO MFG., CO.

62 BERKELEY STREET VALLEY STREAM, N. Y.

TO THE **E. E.** OR **PHYSICS GRADUATE**
WITH EXPERIENCE IN
RADAR OR **ELECTRONICS**

Hughes Research and Development Laboratories are engaged in a continuing program for design and manufacture of advanced radar and fire control systems in military all-weather fighters and interceptors.

YOU WILL serve as technical advisor in the field to companies and government agencies using Hughes equipment.

TO BROADEN your field of experience in radar and electronics you will receive additional training at full pay in the Laboratories to become thoroughly familiar with Hughes radar and fire control equipment.

AFTER TRAINING you will be the Hughes representative at a company where our equipment is installed; or you will advise in the operation of Hughes equipment at a military base.

THE GREATEST advancements in electronics are being made in this sphere because of military emphasis. Men now under 35 years of age will find this activity can fit them for future application of highly advanced electronic equipment.

HUGHES
RESEARCH AND DEVELOPMENT LABORATORIES
Scientific and Engineering Staff
Culver City, Los Angeles County, California

Assurance is required that relocation of the applicant will not cause disruption of an urgent military project.

(from page 59)

Dick, **WNØRQW**, Council Bluffs, Iowa, has troubl "Dear Herb, Well, I just got my Novice license a f days ago, and already I've got one heck of a proble I cannot get on the air when our TV set is turned but not for the reason you think. My 35-watter cau too little TVI to bother my family. But the TV recei puts such an awful screech in my SW-54 that I can hear a thing on it."

Bob, **WN1YNP**, Mystic, Connecticut, says, "Dear He I think amateur radio is the best hobby in the world. have had my ticket for 5½ months and I have worl 37 states and four countries, all on 7180 kc. My tra mitter is a TR-75TV, running sixty watts, and my ceiver is an SX-24. I am thirteen years old and I in the eighth grade. Some of the local Hams helped get my license. Now I am studying for my Gene Class one."

Help Wanted

This first request for help in obtaining an amate license is really big. Bill C. Morris (16) 2575 S. Euc Ave., Ontario, Calif. requests help for himself, his sis Rose and approximately FIFTY members of Rosie's F Club. All of them are around sixteen years of age, ha new short-wave receivers and are studying for th Novice licenses. Bill is almost ready for the exam, b does not know enough radio to be of much help to t rest. Bill is president of the club and Rosie is v president.

There's a chance for someone who wants to turn c new Hams "wholesale." Others requesting help includ

Paul "Porky" Strona (16), 895 W. Philadelph Pomona, Calif.

Jim Hudgel (18), Ida Grove, Iowa.

Stuart Cohen, 77-26 173rd St., Flushing 66, N.Y. Telephone: JA 3-5198.

Henry Steckler, 75-80 179th St., Flushing 66, L N. Y. Telephone: JA 6-8110.

Michael Bobrow (15), 104-21 191 Street, Hollis Queens, N.Y.

J. Arthur McGaffic, 1511 Jackson Ave., New Ca Pa.

John Coleman (14), Box 171, Buckeye, Ariz.

Felton Kennedy, Ho. 324, P.O. Box 151, Ma City, Calif.

Donnie Wolford (14), 6333 W. Miami Place, Mia Fla. Phone: 7-5841.

Edward Oglesby, 319½ Bruce Court, Bess Alabama.

More Letters

The next few letters are offers of help to prospecti amateurs.

D. A. Wells, Los Angeles, writes, "Dear Herb, I wa to thank you for putting my SOS in the July, 19 column. I got a call from KN6BFI, but left for O before we could get together, but I still want him know I appreciated his interest. I got back to Californ two months ago, and a swell Ham, Merrit, W6MR moved in across the street. We are now working on code. (I have the theory almost up to the General Cl level.) Although I am not yet licensed, I would like help anyone in the Inglewood area with their theory. work the "swing shift"; therefore, I am available b tween noon and 3:45 p.m., weekdays and all day a evening on weekends. My address is: D. A. Wells, 34 W. 78th St., Los Angeles 43, Calif., Phone PL-18816.

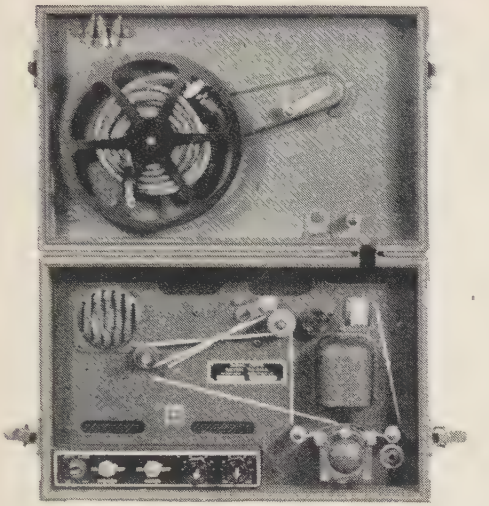
Bob, **W9SQP**, writes, "Dear Herb, I'd be happy to he anyone along on his Novice or General ticket. I a located twelve miles west of Chicago. 73"—Bob Herou W9SQP, 220 S. 17th Ave., Maywood, Ill.

Bob, **WN8NDH**, writes, "Dear Herb, My transmitt uses a 6L6 at about thirty-five watts input. Receiver is S-40A. A **Heathkit** combination antenna coupler a low-pass filter cured my TVI and brought my reports 1½ S-units. I have worked 34 states, Canada and Puer Rico. I will make skeds with stations needing Michig for WAS, and will exchange diagrams and other data amateur radio, as well as help non-Hams get their ticke Just write. 73"—Robert Blue, Jr., W8NDH, 3120 Noes St., Midland, Michigan.

More news and another offer of help. Martin, **KN2GB** writes, "Dear Herb, First of all, I find that my S-38 much more selective since I soldered a ½-inch length wire to **pin 4** (grid) of the 12SK7, i-f tube and bringi the end of the wire over towards **pin 8** (plate) of t tube. This introduces regeneration in the i-f amplifi and the wire should not be made too long or brought t close to the plate terminal; otherwise the stage may bre

(Continued on page 62)

TG-34A KEYER



PORTABLE—115 or 230 V. @ 50 to 60 cycle—KEYER TG-34A is an automatic unit for reproducing audible code practice signals previously recorded in ink on paper tape. By use of self contained speaker, unit will provide code practice signals to one or more persons or provide a keying oscillator for use with a hand key. Unit is compact, portable carrying case, complete with tubes, photo cell, and operating manual. Size: 10-9/16"x10½"x15-13/16". Shipping weight: 15 lbs. BRAND NEW—in original box—While They Last. **NEW:** $24.95 **USED:** $14.95

TG-10 KEYER—Same function as TG-34A, only larger using 2/6N7 — 2/6L6 — 2/6SJ7 — 1/5U4G Tubes & 1/923 Photo Cell. Housed in standard Metal Cabinet; can be removed for 19" rack mtg. Size: 11" H x 24" W x 18½" D. Prices: **NEW:** $29.95 **USED:** $19.95

DYNAMOTORS:

HEAVY DUTY MOBILE DYN.—14 V. input—output: 1030 VDC 260 MA. Tapped 515 V. 215 MA.; @ 6 VDC input—500 V. 175 MA. While they last $14.95 **New:** $29.95
—DM-42: Excel. Cond. . . . . .

INPUT VOLTS:	OUTPUT: VOLTS:	MA.:	STOCK NO.:	PRICES USED:	NEW:
14	1000	350	BD-77	$22.50	$39.95
28	1000	350	PE-73	8.95	
12 or 24	500	50	USA/0515		4.95
12 or 24	275	110	USA/0516		4.95
6 or 12	500	160	PE-103	29.95	39.95
12	230	90	PE-133	6.95	8.95

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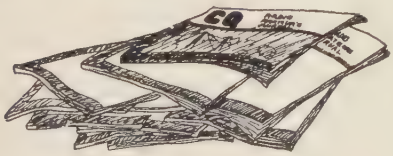

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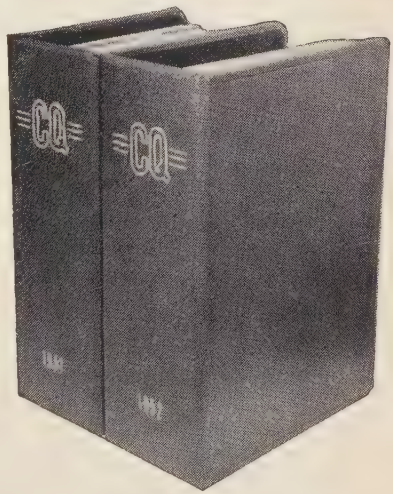

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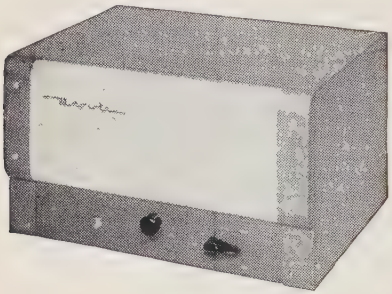

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376	397	419	483	504	526	444	464
377	398	420	484	505	527	445	465
379	401	422	485	506	529	446	466
380	402	423	486	507	530	447	468
381	403	424	487	508	531	448	469
383	404	425	488	509	533	450	470
384	405	426	490	511	534	451	472
385	406	427	491	512	536	452	473
386	407	429	492	513	537	453	474
387	408	430	493	514	538	454	475
388	409	431	494	515		455	476
390	411	433	495	516		456	477
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4330	5706	6300	6925	7675	7975
4397	5725	6325	6950	7700	8206
4490	5740	6350	6975	7706	8225
4495	5750	6373	7450	7720	8250
4535	5773	6375	7473	7725	8273
4735	5780	6400	7475	7740	8275
4840	5806	6406	7500	7750	8300
4930	5840	6425	7506	7773	8325
4950	5852	6673	7525	7775	8630
4980	5875	6675	7540	7800	8683
5030	5875	6700	7550	7825	8690
5205	5880	6706	7573	7840	
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1940	3990	6550	7175	8100	8575
1950	6000	6573	7200	8125	8600
2065	6025	6575	7250	8140	8625
2125	6050	6600	7300	8150	8650
2557	6075	6606	7306	8173	8700
2940	6100	6625	7325	8175	8733
3500	6125	6640	7340	8200	
3640	6140	6650	7350	8340	
3680	6150	7000	7375	8350	
3720	6175	7025	7400	8380	
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(Continued from page 60)

into sustained oscillations, indicated by the receiver acting as if the beat oscillator is on, even when it is off. This idea may also be used with the **SW-54** by soldering the wire to **pin 1** of the 12BA6 and bringing the end of the wire towards **pin 5**. I shall be glad to help prospective amateurs get their tickets. 73"—Martin L. Serling, KN2GBJ, 131 Seth Boyden Terrace, Newark 5, N.J.

Your experiences would look good in the column; so I hope to hear from you soon. See you all next month. 73—Herb, **W9EGQ.**

DX NEWS

(from page 40)

land during the time and reports from W8's, whose receivers were blocked, place him in the Detroit/Dearborn area. (To these misguided characters who periodically pull these tremendously funny, to them, escapades we cannot adequately reply within the bounds of acceptable language!) . . . **VK1AC**, Heard Is., has been worked on 14010. This station, ex-VK3ACI, is using the 1AC call instead of VK1CI as mentioned in the Jan. issue . . . **OY1P**, Faero, Is., has been on 14103 around 1400 GMT . . . **MP4BEN**, recently active from Qatar, has now gone back to Bahrein Is. but will return at some future date . . . From OK1MB we learn that **VQ8AB** has been on 7030, **PX1AA** on 7032, **EL2X** (ex-DL4EA) on 14022 and **MP4ABW**, Qatar, 14122, 1100 GMT, A3 . . . **CR6AI** seeks VK1 contacts on 14060 between 1500/1700 GMT.

We remind you that the **DL4QX/SU1BJ** combo will probably show from Crete this month . . . **KV4BB** QSO'ed **XW8AA** and received a speedy QSL . . . From W6YY we hear that the new prefix for PK2 will be JO . . . Those receiving QSL's from **ZS9I** may consider themselves very lucky. They don't come easy . . . **EA4BH**, ex-EA9DD, states that he has no definite plans to return to either Rio de Oro or Ifni at present . . . **AP2R** has now folded and henceforth will be heard as G3GJQ. QSL's have been 100% . . . **VS9AD** is also QRT and should be a G very shortly . . . SU nationals will soon be permitted to go on the air with a 100-watt maximum . . . W7MO reports **LB9IC** is located on Andoy Island just Northwest of LA: . . . G8IG says: Watch for **ZD8A** on 14100 . . . FA8VN gives us fair warning that **FL8CJ** is expected to appear on 14075.

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ET2PA—Erik Unnergaard, Ethiopean Imp. Air Force, Asmara, Eritrea.
HC1CB—U.S. Army Mission to Ecuador, U.S. Embassy, Quito, Ecuador.
HH3RC—Rev. Roger Colvin (W3PWH), Box 1, Cap Haitien, Haiti.
JZØKF—W and VE QSL's via W2KMZ. Others to VK9YY.
OD5AV—(ex-OD5BH) Box 235, Tripoli, Lebanon.
VE7 Bureau (New)—Henry R. Hough, VE7HR, 2316 Trent St., Victoria, B.C. Canada.
VK6EJ (ex-G2AJU)—c/o Mr. W. Aggiss, "Hadleigh" Farm, Karlgarin, West Australia.
VQ4EI—Box 777, Nairobi, Kenya.
VQ4NZK/VQ1NZK, etc.—Box 1313, Nairobi, Kenya.
VQ5EK—Box 1, Kampalla, Uganda.
W4NXE/KS4—c/o C.A.A. Swan Island, via Tampa, Fla.
W8BRA—Dave Kennedy, 3482 Whitfield Ave., Cincinnati 20, Ohio.
ZB1CM—Via ZB1E.
Thanks to West Gulf Bulletin, W3AS, W5ALA, W5FXN, W7MO, FOC Bulletin.

160 Meters

Next regularly scheduled is on March 14 0500/0800 GMT. We are able at this time (Thanks to W1BB) to give reports on the Dec. 20 trial runs, Jan. 3 tests and partial reports on the Jan. 17 tests as follows: Among the W stations active on Dec. 20 were W1BB, W1AHX, W1TVD, W2PA, W2TRK, W3RGQ, W3FNF, W2WC, W4KFC, W9MEM, W9NH and others. DX present were CN2AO, EI9J, G6GM, G3PU, G6ZB, GC3EML, GW3ZV and VP7NM. W1BB worked all of the DX except G6GM, VP7NM and GC3EML. WØNWX nabbed KV4AA and VP7NM. Loran QRM at WØNWX makes it impossible

(Continued on page 64)

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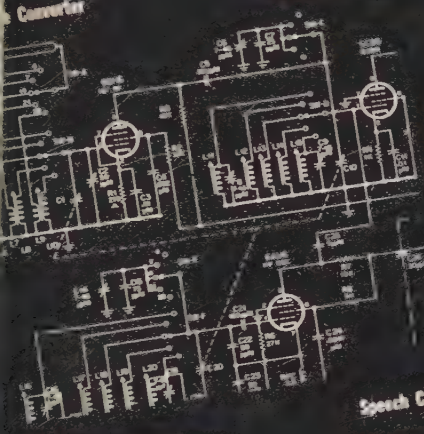

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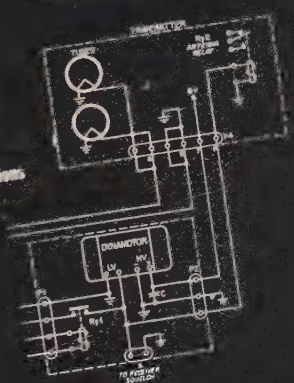

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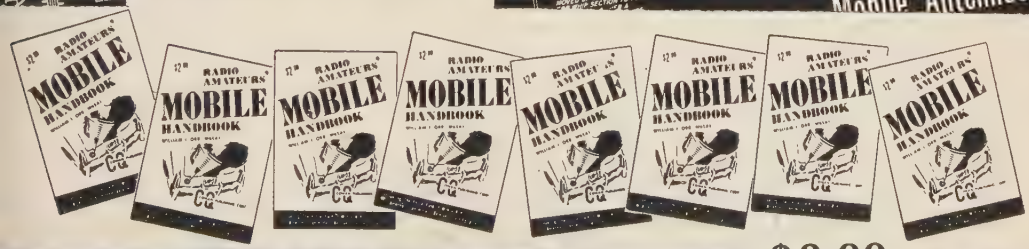

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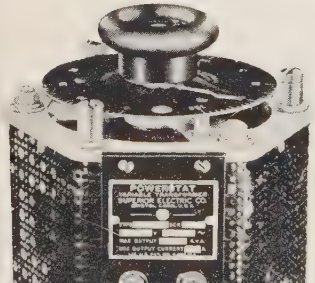

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(from page 62)

for Bob to work any DX in the 1835/1870 segment o the band. Conditions were very good on Dec. 27 an W1BB worked CN2AO, G6BQ, G5RI, G3BKF, HB9CM G6GM, G5JU and G3PU. CN2AO and G5JU peaked a high as 589! After a QST by W1BB that 1800/180 should be used for calling and working W9's and WØ's several such contacts were made. On Jan. 3 condition deteriorated from a W standpoint, but seemed to pick u in the Caribbean area as KV4AA worked G5JU, G6B and EI9J. GW3ZV and EI9J came through steadily an VP7NM and KV4BB were active. Conditions seeme good for the Jan. 17 tests. QSO's were logged betwee KV4AA and VE1EA, VE1ZZ, W2EQS, GW3ZV, W9CVQ WØNCS, W9PNE, W2WWP, W2QHH. W3EIS, W9NH W2GGL, W2WC, W8BNJ, W9PM, W8KJK and G2PL KV4BB nabbed CN2AO who was putting in a consisten 56/79 signal from 0430 to 0700 GMT.

WØNCS QSO'ed a station signing **VR2BJ** on Dec. 2 0630 GMT . . . **GW3ZV** was heard by LU1EP, 569, 085 GMT, Jan. 3 . . . W3RGQ worked **VR2BJ** on Jan. 2 . . . **VP7NM** was country No. 13 for W2QHH . . . **KZ5DI** has been heard on 1887 . . . W9NH QSO'd **LU4DM** i Nov. . . . All in all this seems to be a most successfu season with activity at an all time high and the result surprising. More dope will be forthcoming in the Apri issue.

Exploits

W6DLY upped to 217 with OD5LX and LZK1AB . . . **W6EFM** nabbed LB8YB to reach 215 . . . **G8IG** adde VR4AE on A3 to hit 213 and 183 while **G3DO** keye with VQ9UU and EA9DD to reach 201. His phone tota went to 175 with VQ1NZK, VP8AJ, FM7WD, 9S4BS an PJ2AF . . . **W6BUO** came up to date with 21 addition which included such as LB8YB, LZ1KDP, LU4ZO KAØIJ, ZP5AY and VP5BH . . . **KV4AA** had a poor but permanent QSO with ZC5VS for No. 233 whil **W9LNM** came to 219 with CEØAA and VP8AK . . . **W5FFW** snagged 9S4AX, OD5LX, CEØAA and EA9DI to stand on 204 while **W9HUZ** makes it an even 20 with VQ1RO, EA9DD, and VP2GRO . . . **W9ALI** got t 132 with ZS3B and LU4ZD . . . **W2GVZ** adds FK8AC fo No. 178 while Eric, **OZ7BG**, rises to 173 with HK4FV an EA9DD . . . **W4EPA** went to 152 with VP2GRO a **W2ZVS** hit 161 with I5LV . . . Sam, W3AXT, nabbe plenty of DX, but ZC4RX was the only new one, No 152 . . . **ZS6Q** submits WØWNI/VO6 for a new phon zone and 17 A3 additions to reach 192 . . . Lou, **W1MCW** goes to 208 on phone with LU9ZS and LU4ZD . . . **W2LYO** hasn't been doing badly on 3.5 with such a OK1MB, YI3AR, YU1AD, SP3AN, ZD4AB and PY6ABS 7 Mc. accounted for VP2GRO, FKS8BC, ZS6RB and ZC4IP . . . **W6ZZ** reports 21 Mc. as way below par bu managed to A3 with ZS9G, ZS1MP, CP5EK and plenty of others. Miles also produced CR9AH on a short 1 CW spurt.

CE3DZ received a QSL from FB8AX, Terre Adelie QSO'ed in '50! . . . Don, **W6AM**, has been awarded the Argentine Certificate C.A.A. No. 638. He also has the C.C.C. Award for Phone and CW and the LU- T.P.A Award . . . **W4BRB** has worked 108 on 3.5 with 10 confirmed. The missing card is for ZS9I QSO . . . **KV4BB** knocked off JA8AA, JA3BB, JA2XE, JA8AQ JA9MF and JA9AI around 2250 on 14 CW . . . **W8BHW** is up to 119 on 21 Mc. 96 of 'em were on phone! . . . VK3XB added HR1AT . . . **W9SZR** hooked KV4AA fo No. 6 on 14 Mc . . . **W3SLK** and **W3UNL** threw up a Vee beam 206 feet per leg and had no trouble hooking such as OZ7SP, ZB2A, ZB1CM, XE2R, HR1FU and DL4RM on 20 . . . **W5ALA's** latest are LB8YB, ,LZ1KPZ 3V8AN and SP1KAA . . . VE3IG is up to 40 on 3.5 and is looking for Asia to complete WAC . . . **PY2JU** brings his 21-Mc. phone total up to 70 with ZE2JK, ZS9G KL7AON, DU7SV and CR7AD. We will resume our separate 21 Mc. column when cdx are a little better there John . . . **W6EFV** nabbed ZD2HAH who is rock-bound on 14072. He needs QSO's with W7's for WAS. Two new ones at 'EFV were ZD4JB and OY2Z, 14045, 2145 GMT . . . **WØQFQ's** Viking II has accounted for 63 countries on 21 in the past few months with such morsels as HI6EC, FF8AP, VP5SC, ET2MK, TG8IH, OQØDZ, CR4AI, VQ4RF, ZE2JE, OQ5NK, ZD9AA and CR6BA . . . **DL1FF** went to 105 on 3.5 Mcs. with FY7 and KL7 . . . **W8BTI** and **W4GG** nabbed AC4NC on 14042 around 1630 GMT.

Here and There

G2AJU is now **VK6EJ.** See QTH's . . . From Miles, W6ZZ, we have the following: **W6TTB** has started what he calls the "UFO Seminar" on 21,400 phone at 2000 GMT daily. UFO stands for "Unidentified Flying Ob-

ects" and all those who have any **authentic** data or ex-eriences on "Flying Saucers" (or what have you) are nvited to call in on this net to add their data to the naterial already collected, which will be tape recorded nd rebroadcast for the information of all interested arties. Quite a bit of tape recordings have already been ent out in addition to book references on the subject. keptics are especially urged to tune in so that they can e convinced that such objects do actually exist and ossibly help in solving this long-standing mystery . . . **V8BRA** has now changed QTH's to Cincinnati . . . We re happy to hear that Alfredo, **CE3DZ**, seems to have icked his throat tumor. Al says his voice is getting etter and describes his condition as "good, fat and pirited" . . . Bob, **W4PFH**, gets on occasionally from KA2JF and tries for east coast QSO's between 1700/2000 CST. KA2JF may be changed to KA2CC shortly . . .

NEW CUBAN AWARD, WWI
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The Radio Club of Cuba, Lealtad 660, Havana, will present this award to any station submitting proof (QSL's) confirming contacts with the following prefixes:
One CO1, Five CO2, One CO5, One CO6, One CO7, One CO8 and One each from KG4, KS4, VP3, VP4, VP5, VP2, VP6, VP7, HH, HI, KV4, KP4, FG7 and FM7. (Thanks to CO2OM)

V1RST says the idea of rare DX stations answering calls least 5 to 10 kc. away from their frequency, only, ould be plugged in each issue until the idea is ham-ered in for good . . . **VE3IG** says that DX stations hich do not QSL should be barred from all **CQ** and **RRL** awards. That's rough, Hal, but still an idea. here are plenty of W stations willing to take over the SL headaches for such stations so there isn't much ex-se for them. QSL'ing must be accepted as "part of e game."

From W5ALA we hear that ZC5VS had a month long ut with malaria and after that, worse luck, had his ower supply choke go west on him. Hugh would like trade North Borneo, Sarawak and Brunei postage amps for a commercial Ham rig so that he could work one and CW on his planned jaunt to Sarawak/Brunei. 4CEN advises that ZC5VS has a Navy TCS6 receiver r which he would like data to enable him to convert to 230-volts a-c for use on 7 Mc. . . . **LU5AQ** tells us at all QSL's for LU-Z stations have gone out . . . V4AA logged the following visitors: WØGDH and mily, G2RO, W9EUJ and VP2VA . . . Jack, **W2BXS**, now back at the Bethpage, L.I. QTH after DX opera-ons at KJ6, KM6 etc. Any missing QSL's will be re-aced. Jacks XYL, Lee, is now K2ESO . . . **LB9AA**, ard on 7 and 14, is aboard a Norwegian Ship accord-g to W2BXS . . . W2KMZ, Frank, has arranged to ndle all W/VE QSL's for **JZØKF**. Foreign QSL's go JZØKF via VK9YY . . . The Fifth Annual joint eeting of the Frankford and Potomac Radio Clubs was ld on Jan. 31 in the Casa Conti Hotel, Glenside, Pa. . . W5QKZ rec'd QSL from **KW6BB** via W6LYG. **W6BFC** may be reached at the Veterans Administration nter, Special Services Div. Los Angeles 25, Calif. **W2SAI** has been trying out his new vertical 7 Mc. am. This is mounted on his 100 ft. pole and employs a reen reflector 20 x 90 ft.!! . . . Congrats to **W9DUY/8** the arrival of a six pound YL op. Don recently moved Ashland, Ohio, and should have his new W8 call by w . . . W4ZAE's QSL to ZD1C bounced. The ZD is phone only . . . Lane, **KG4AN**, was slated to return W5ADO at the end of Jan. . . . W2CTO, Bob, seeks SL's from LB6XD and FB8BE . . . **DL4ZC**, in Karls-he, is none other than Lloyd. W4KE . . . **W6VUP** en-ys new QTH on top of ridge in LA . . . KA5RC is 4SSS . . . JA8AA listens for east coasters on 14100 m 2200 to 2400 GMT daily . . . G3AAT/OX would lcome any radio publications from the gang. They ay be sent via Thule . . . Our boy Egon, **4X4RE**, is a wlywed, Congrats! . . . **W5TOE** kicks out very well, 7 Mc. with the new 4-400 rig and quarter wave GP t. . . . Ed, **W9YFV**, visited N.Y. and then hopped er to Fresno . . . **W4EPA** vacationed in Charlotte, N.C d visited W4CEN . . . **W6UYX** now has a new toy, a 1000A! . . . Doc, **KR6AA**, wants it known that he wil ly QSL when the other guys card has been received as SL percentages covering activity from KA9AA and A2 were pitiful . . . OD5BH is now active as **OD5AV**. e QTH's . . . Congrats to Bill, **KV4BB**, on his appoint-nt as Ass't SCM of Southeastern Division.

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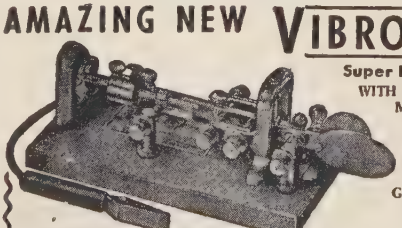

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THE YL's FREQUENCY

(from page 42)

ting. To top if off, it was accompanied by the verses by W4HDC:

When the wifey gets a ticket
You will find it isn't cricket
To spend hour after hour at the rig.
In the basket lies the stichin'
Dirty dishes in the kitchen,
For the housework she will never give a fig.
There are cobwebs on the ceilin'
But like dustin' she's not feelin'
She would rather chew the rag all day on ten.
Shortwave gossip she is learnin'
While the taters they are burnin'
And the junior op is cryin' in his pen.
I have taken up a hobby—
But for which I will not lobby
Lest you think that I am soft'nin' in the head.
At my story you'll be weepin'
For my hobby it is sweepin',
I'm a whiz at sweepin trash beneath the bed.
I am also learnin' knittin'
And I'm knittin' while I'm sittin'
As she chatters in the mike and has her fun.
But tomorrow to her sorrow
That ole microphone I'll borrow
For tomorrow is the day her hair gets done!

Incidentally, W4OPE gave his permission to r print this photo—he says it's already spread over th Southeast and a little more publicity won't hurt Of course, it was all a joke. When Sarah got h ticket a year ago January he told the fellows tha he would have to take up knitting because he neve would get to operate the rig any more. But wit two junior ops—a boy 17 and a girl 10—Sarah can spend all her time at the rig.

W4UUM and W4OPE operate 75 and 10 phon and 80 CW, and were planning a vertical antenna fo 40 and 20. They use a *Viking II* and an *NC125.*

"The OM and I really do enjoy Ham radio to gether," Sarah adds, "and it's pretty nice to have th same hobby. We have made many friends and hop to make many more."

Putting in a good word for the XYLs, in reportin the NYLON net news, W7SFR, Lorraine, says: "Th OMs who say the gals let the housework go whil they are on the air are all wet! No wasted time o this net—the gals clean the house within range c the loudspeaker, catch up on the ironing, and dar the OM's socks."

So—good luck to you XYLs who go after a ticket The Novice Class is an almost "painless" way t start out, and once you've tried Hamming most c you will want to stick with it.

Here and There

WØKQD, Irene Craft, of Alamosa, Colo. offers goo proof of how helpful the Novice license can be. WØIU tells us Irene got her Novice ticket in July '52. Usin the station of the local club, the Ski-Hi Radio Club, o which she is secretary, WNØKQD worked 22 states an got her code speed up to about 22 wpm. When sh passed her General Class in Denver with flying color her OM bought her a Mon-Key, and now Irene rattle along between 15 and 30 WPM. Her OM, WNØQXF also has built her a 75-watt transmitter, and they us an NC183 receiver.

New check-ins with the NYLONS are **W7UVM** Beatrice, in Idaho, and **W7TGG**, Vera, in Montana. Th NYLON YLs are very proud of member **W7PQW's** al

Ham family in Seattle. There is PQW, Jane; her OM, Tom, W7KPC; his mother, Besse, W7UZJ; and Jane's junior ops; James, 14, WN7UZH; Beverly, 13, W7UUM, and Elvin, 12, W7UUI.

A wonderful letter from **W9FZO/4**, at West Palm Beach. Helen and Ralph are busy with their new 49-ft. fishing boat, the "Barcardi." They have a 75-meter rig on their ship in conjunction with their ship-to-shore radio setup and Helen says when she gets to go with no fishing in mind (as if that could ever be), she'll get to operate. She got a big thrill out of catching her first game fish, a six-foot sail. They are working on their Ham shack, a new room added to the house, and have their 40' tower cemented into the patio outside.

The **Los Angeles YLRC** had ZL1GI as guest speaker at their November meeting. Their December meeting was a Christmas party, with a record turn-out of about 32, including the children. The club now has issued approximately 30 of their "Lad-'N-Lassie" certificates . . . Former club member ex-W6NLM, is now **W4DEE**. Beulah and OM, W4DEM, are on 20 meters from 903 Moly Drive, Falls Church, Va.

YLRL Net Changes

YLRL Veep W2OWL has announced these changes in the nets. The 75-meter phone net which has been meeting at 7:00 a.m. EST, Wed., on 3900 kc, now changes to 7:30 a.m. and has as new NCS—W1VOS, Marje. The net following that one at 8:00 a.m. EST with W8HLF, Arlie, as NCS has changed from Wed. to Tues.—same time, frequency. Also the new 40-meter phone net which has been meeting on Wed. at 2:00 p.m. EST on 7215 kc, with W4SGD, Katherine, as NCS, has changed to Thurs. at 10:00 a.m. EST. On the 20-meter phone net which meets on Thurs. at 2:00 p.m., W6UHA, Maxine, has replaced W6EHA, Gen, as NCS.

The NYLONs (Northwest YL Operators Net), often mentioned in this column, meet on 75-meter phone on 3820 kc on Wed. at 9:00 a.m. PST, with W7QYN as NCS and W7JFB as alternate NCS.

SK

No sooner do we receive our WØ call than off we go again, this time to W7 land. Somehow most everything seemed to go SNAFU in Colorado. We were supposed to work also for the Ute Mountain Ute Indian Agency, but could find no one to stay with the junior ops. We'd even gotten a mobile rig so we could do some Hamming on the daily drive from Cortez to Towaoc. An all-**Elmac** set-up, W5ZMN put it in with the help of 5YKZ, UVA and VDY just before we left Los Alamos. W5ZMN had the transmitter and dynamotor, and he picked up the receiver from 5DWB, an antenna from 5NXE and relay from 5WPA, and the whole thing was installed in one week! Well, maybe one of these days we can use it. But since we can't work, it's so cold at Cortez, and the junior ops have been ill so much with colds, croup, pneumonia, etc., we're packing them off to Phoenix in the Valley of the Sun for the rest of the winter. What a lot of explaining we'll have to do when we have a QSO from there—hi!

CUL—**WØSCF/7, ex-W5RZJ**

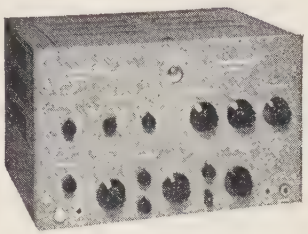
TEST EQUIPMENT

(from page 30)

tube. This leads to all sorts of unfortunate phase conditions. Many times a small tuned circuit placed across the deflection plate leads as close to the tube as possible will enable the operator to tune out the reactance of the internal tube leads. We have found cases where the r-f voltage on the vertical plates would induce r.f. on the sweep plates. The first impulse is to bypass the sweep plates for r.f., and in some cases this does the trick. Other times this will only make matters worse because of the large amount of lead inside the tube. In this case the answer is to tune out the reactance by adding either inductive or capacitive reactance as the case may call for.

NEW BANDSWITCHING MULTIPHASE EXCITER

MODEL 20A



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AP-1 Plug-in IF stage—used with Slicer, allows receiver to be switched back to normal. Wired—tested, with tube $8.50.

PS-1 Plug-in pre-aligned 90° phase shift network and socket available separately. $7.95 postpaid.

QT-1 Anti-trip unit. Perfected voice operated break-in. Prevents loud signals, heterodynes and QRN from tripping the voice operated break-in circuit. All electronic—no relays. Plugs into 20A or 10A exciter. Wired and tested, with tube $12.50.

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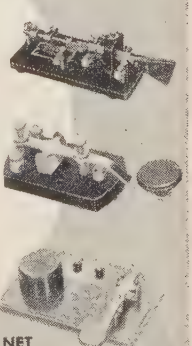

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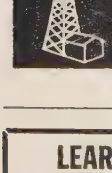

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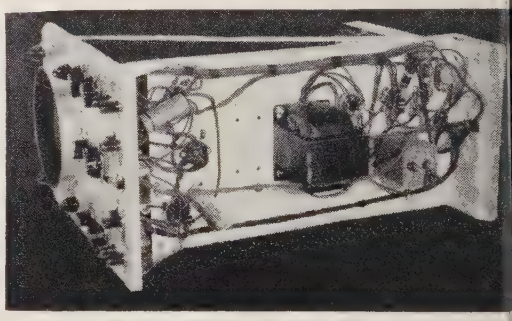
Because there are so many things that can b measured with a 'scope which demand in them selves considerable detail, we have refraine from going into any involved circuitry of tes ing at this time. At some future date, perhap a complete story can be written around ne and different uses for 'scopes.

It's uncanny, fellows, but you have guesse it. The fourth kit that we assembled was *Heathkit* scope. We must admit that its pe formance was quite surprising for a 'scope i this price range. When one gets used to thinl ing of 'scopes in terms of fifty, seventy-five or on hundred tubes, he is pleasantly surprised t find what ten tubes can do. Another feature that it does not require a small hoist to lift i

From a technical standpoint we found th following: The response called out in th specs for the vertical amplifier were ±2 d from 10 cycles to 1 Mc. and ±6 db. from cycles to 2 Mc. Our particular instrume



Bottom view of the Heathkit oscilloscope.

proved to be very useful to 3.5 Mc. The i dividual r-f waves of a 75-meter transmitte could be shown on the screen. The sensitivity better than .025 volts per inch at the audi frequencies.

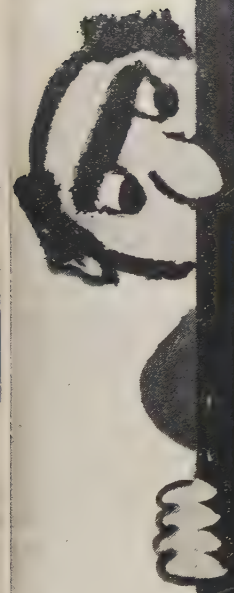
In the horizontal portion a hard tube swee circuit is used with a range of 15 cycles to megacycle and the horizontal amplifier is quit good to 1 Mc. Sufficient controls are brough out to make the unit quite versatile. Dire connection to the plates can be made throug a small door in the rear of the case; even pr visions for intensity modulation are provide

As we said in the beginning, the constructio of a 'scope is very simple and this particul one required only a few hours.

In closing, here is just a word of warning. scope is a double hazard if handled carelessl The high voltage used can be very dangero but Hams should not need a warning on th score. The other danger is a breakage of th cathode ray tube. Flying glass from such a tu can cause considerable damage and cuts cause by glass from the face of the tube may be ve difficult to heal. Glasses or even a transpare face covering should be worn when handli cathode ray tubes.

Sneaking a Look at the Future

CQ RADIO AMATEURS' JOURNAL



Many of our readers who were not subscribers to CQ back in 1950 will be pleased to hear that Bill Scherer, W2AEF, is working up a new model and a completely new story on the use of the ANTENNASCOPE. This popular device has been copied commercially and appears on the market under several different names. Our readers, however, will find it both easy to reproduce and extremely valuable around the shack. Don't miss "ANTENNASCOPE—1954" which is currently scheduled for the May or June issue of CQ.

Another test instrument which will attract considerable attention in the Ham field is the "Q-Box." This device, perfected by W2FRQ, is a Q-Meter that can be built for the barest fraction of the cost of its commercial equivalents. If you've ever wondered whether those tank coils were any good, this will give you an excellent idea of exactly just how they look in the circuit.

Throughout the past few months we have briefly reported on this page what CQ intended to do in its next few issues. The idea we are trying to get across is obviously: don't take a chance on picking up a newsstand copy—take out a subscription and let the mailman do the work of delivering it right to the shack. Besides the convenience of having your own valuable file of CQ, you save money over the individual newsstand price.

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CLOSING DATE: the 25th of 2nd month preceding publication date.

WRITE: CQ Magazine, 67 West 44th St., N.Y. 36, N.Y. Attention, Jeanne C. Gillespie.

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SELL: Speech amplifier & modulator: 6SJ7-6C5-6F6-807's PP., 50 W. All Thordarson units, with 75w "Multi-Match" mod. transformer on heavy aluminum chassis, with all tubes, new, never used. 25% off from parts net cost. Details, WØREG, Carl Fastje, Denison, Iowa.

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BARGAINS: EXTRA SPECIAL: Motorola P-69 series mobile receiver, $19.50; Gonset 10-11 converter $19.95; DM36 10-meter converter $19.50; VHF-152 $49.00; Breting 12 $49.50; HF-10-20 $59.00; S-40A $75.00; RME-45 $99; RME-2-11 $99.50; HRO Senior $99.00; SX-43 $119; S-76 $149; SX-71 $169; SX-42 $189; HRO-50 $275; 75A1 $275; MB611 mobile transmitter $14.95; 90800 exciter $22.50; HT-17 $32.50; EX Shifter $69; Globe Trotter $69.50; TBS-50D $99; HT-9 $199; Supreme AF100 or Temco 75GA $225; Globe King $295. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories at NEW ADDRESS, 3415 West Broadway, Council Bluffs, Iowa.

SX71 AND SPEAKER $200; HT18 5-band AM-FM VFO $75; HFS and power supply $125; ARC5 receiver 6-volt with tubes and 522 transmitter less tubes $25; Harrison Antenna Coupler with all coils $35; Gardner tape machine with 10 tapes $15. John Schwerbel, 111 West Hoffman Ave., Lindenhurst, L.I., N.Y.

NOVICE TRANSMITTER: 6L6-807 (Millen schematic) Millen coils; TVI proofed with special copper cabinet, Sprague Hi-pass condensers; bias supply on separate shelf; control panel has high amperage switches and 2 extra Triplett meters; in 36" grey crackle Bud cabinet. Antenna tuner in grey cabinet. Used 2 months. Cost $171 to build. $76 takes all. Dr. Irving Vics, W2KVQ, 610 Western Avenue, Albany, New York.

FOR SALE: All 1953 production: Hammarlund HQ129X, $199.50; RME HF 10-20, $92; sideband slicer "A," $74.50. All for $200. W9KPD, William F. Frankart, 1259 South Boeger, Westchester, Illinois. Reason for sale: bought a SX88.

SELL—Heath 0-8 scope A-1 condition. Expert wiring with extra CR-tube $45. W2HFFM, Bedell, 60 Lindgren Street, Merrick, New York.

REAL BARGAINS: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Elmac, Gonset, Babcock, Morrow, RME, Millen, Meissner, Lysco, others. Reconditioned S38 $29; S40A $69; S40B $79; SX43 $99; S76 $129; SX71 $169; SW54 $35; NC57 $69; NC57B $79; NC125 $129; NC183 $199; HRO50T1 $299; HRO60 $399; VHF152 $29; HF-10-20 $39; TBS50C $79; TBS50D $99; HQ129X, 75A1, 75A2, 32V1, 32V2, Viking I, Temco 75GA, HT9, many others. Shipped on approval. Easy terms. List free. Receivers rented. Write for details. Henry Radio, Butler, Missouri.

SX42 HALLICRAFTERS $140. Radioman MorMacstar, Pier 32, North River, New York City, N.Y.

SELL: Dual power supply: one at 600 volt or 750 volt d.c. @ 300 ma., separate 6.3 volt 6.0 amp. fil. supply, 866 Jr. rectifier; one at 325 volt d.c. @ 125 ma., 83 rectifier. All Thordarson units on heavy aluminum chassis, new, never used. 25% off from parts net cost. Details, WØREG, Carl Fastje, Denison, Iowa.

FOR SALE: 32V3. New condition, with manual and original packing case, $600. W8ZBD, 511 North Warner, Bay City, Michigan.

SELL—Eico tube tester #625 $25; signal generator #320, factory tested $20; 500 ma choke $10; 20TVL coil, new $2; condensers, National TMC-100 $3.50; New, Cardwell XP290KS, $5. Gerard Moor, W1OGY, 53 Garland Avenue, Cranston, Rhode Island.

Positions Offered:

ELECTRONIC TECHNICIANS: For permanent positic with Sandia Corporation. Armed Forces acquired rad or electronic experience desirable; trade school certific with minimum five years' experience. Versatility, capat ity and willingness to work most essential. San Corporation, a subsidiary of the Western Electric Co pany, operates the Laboratory under contract with t Atomic Energy Commission in Albuquerque, New Mexi Excellent working conditions and liberal employee be fits, including paid vacations, sickness benefits, group l insurance, and a contributory retirement plan. No ho ing shortage in the Albuquerque area. For further inf mation write to: Section 1, General Employment Divisic Sandia Corp., Sandia Base, Albuquerque, New Mexi

For Sale:

MUST SELL: Transformers and chokes. New, Thords son T57C51, T13C30, UTC PA120, S20, Stancor A38 C1413, C1403. Used Stancor A3845, A3801, P3060, P40 Thordarson T13C30, T46163, T70R62, Merit 3132, Keny T656, T510, T166, UTC FT-5. B&W 40 TVH coil a mounting base; Coto antenna coil; National TMC-1 variables; used 4 μfd. 1000 volt, 4 μfd. 1500 volt; 2 μ 1000 volt; 2 μfd. 1500 volt; Aerovox electrolytics, 4-8 μfd. 600 volt dual electrolytics, Bud code practice osc lator. Bob Pearson, W4SKK, ATU801, NAAS Kingsvil Texas.

SELL: RME 45; 300 watt 10-20 phone transmitter—4 watt CW transmitter—75/150 watt CW phone transm ter. Want: 156 Mc. mobile equipment. H. K. MacLe William Street, Seaford, New York.

SX-28 RECEIVER, AR-88 receiver. Both need some wo and are in working condition. $75 each. SX-71, used ve little, looks like new $150. Miscellaneous items for t Novice cheap. Howard Hodson, 521 South Ridge Driv Lexington, Kentucky, W4NCQ.

HQ120-X WITH 6" SPEAKER $86; Sonar SRT-120 tran mitter less power supply $148; SCR-522 regulated pow supply $24; 1950 Motorola deluxe auto radio less he $17. All o.k. E.L.Self, 1109 Florence St., Greenwood. S.

NEW T21M64 300 watt modulator transformer $22.7 2 good 828 tubes $5.15 each; 3 new 866A $1.00 each; good 4E27/8001 $5.75 each; 2 115 volt 60cps 10v 1 1600 volt ins. transformer $3.25 each; 1 Stancor A47 driver transformer $5.60; 1 Stromberg motor-generat new 12 volt/680, 6 volt/340, d.c. .210A 5x4x7 $8.75; 5 2μfd. 2 kv Pyranols $1.25 each; 1 GE transformer cps, with pri. taps, 110 volt to 3000/1500 rms. 750 10x6¼x7 $9.40. All items guaranteed satisfactor W9SQZ, A. Garon, 2236 Chestnut St., Fort Wayne, In

LYSCO 600 TVI-proof transmitter and BC348-Q receive Both in perfect condition. Best offers. W9JWN, 22 South 105th Street, Milwaukee 14, Wisconsin.

FOR SALE—two BC232 Walkie-Talkies—$25 each. M. Reed, W8JEY, 387 Clink Boulevard, Crestline, Ohio.

GONSET two-meter converters $24.95; 10-11 converte $24.95; RME MCH4 converters $39.95; Sonar MR- mobile receiver $39.95; Eldico TR75 transmitters $39.9 Meissner EX Signal Shifters $39.95; many other use items. Ask for latest list of receivers, transmitters, te equipment, etc. We trade and offer time payments. Als handle all leading brands of new equipment. Conta W1BFT at Evans Radio, Concord, New Hampshire.

ARC5, 85 kc. i-f transformer #7267 new, $1.65 each PE-101-C converter, new, $5.95; Heath VTVM V6, $2 TC1P tube tester $36; Eico #1040 $25. Back issues CQ—Nov. '49 to Dec. '53, best offer, all or part. All plu postage. Want BC348Q. Send details. M. J. Marshall, 45 Washington Avenue, Dumont, New Jersey.

FOR SALE: Eimac 4-125A's, $17 each; Stancor speec clipper, $5.50; General Radio 115 volt Variac, $1 Thordarson plate transformer, 1975-1570-0-1570-1975 vol at 500 mills, $24; overload relay, rectifier tubes, filame transformers and filter condensers; 150-volt AC Westing house 3" sq. meter, $3.00. Radiart vibrator supply f mobile, 200 mills, $14.00. Also 304TL, 807W, 6J6, 717 WØEHF, 2558 Ida Street, Omaha, Nebraska.

TELEVISION SET suitable for monitor cheap. Wa Multiphase or Eldico SSB Exciter. W4API, 1420 Sou Randolph, Arlington, Virginia.

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For Sale:

SELL: Boehme automatic keyer, $95; Collins 30-J transmitter, $350; SX-71 receiver $140; S-25 receiver $49; teletype equipment. Write for details. Want: Collins exciter, 310; AR-88, ART-13, BC348-R, DY-17, BC610, TCS, APN-9, Sig catalogs, technical manuals, panadaptor. Will trade. Tom Howard, W1AFN, 46 Mt. Vernon Street, Boston 8, Mass. RIchmond 2-0916.

SELL OR TRADE for mobile gear, BC312 with AC power supply $65, BC639 VHF receiver 100 to 158 Mc. $89.50. WØLMF, 1300 Fulton, Aurora, Colorado.

SELL OR SWAP Dumont 208 5" scope $150. BC221-T in Bud cabinet $50. Millen 90800 50-watt transformer $20. Simpson model 380 wavemeter modulation indicator $30. Amprobe VR 25 $15. Silver Micromatch 908 $25. Need 8 mm movie camera and projector. Levern Glau, Route #1, Sioux City, Iowa.

CLEANING HOUSE—transmitters, high and low transformers, chokes, tubes, coils, power supplies, mikes, etc. Terrific bargains. Send for complete list. Al Booth, W1TUX, South Street, Coventry, Connecticut.

COLLINS 32V3. Just like new. On air about 10 hours. Reason for selling—no time to operate. Best offer. Dr. R. S. Rea, P.O. Box 71, Dundee, Illinois. W9OS.

SALE: NC-88 receiver $115. SW-54 receiver $52.50. Both guaranteed new condition. Lysco 600 Transmaster excellent $89. Cleaning house, free list. W6ODD, P.O. Box 776, Camarillo, California.

NOW you may subscribe directly to the favorite British experimenters magazine, "The Radio Constructor." 6 month trial subscription only $1.25; 12-month subscription only $2.50. Sample copy 10c to cover postage and handling. Box GF, c/o CQ Magazine.

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Wanted:

WANTED: 4-1000A, 600 mill chokes, 600-1000 watt modulation transformer, 500 mill 3" square illuminated Simpson meter, Shure unidyne mike. State lowest price in first letter. Sam Thompson, Shattuck School, Faribault, Minnesota.

WANT: AN/ARC-1's, AN/ARC-3's, BC610-E's and components. Write—B. Spivey, 7013 Rolling Road, Chevy Chase, Maryland.

WANTED: ART 13, TCS, BC-348, SX-71, NC-173, HQ-129X, etc. FARR Electronics, Box 273, Lexington 73, Mass.

WANTED: Good H.F. signal generator; oscilloscope; other measuring equipment. Buy or trade for Ham gear. W8LSA, 1108 Clearview Avenue, Parma 9, Ohio.

WANTED: TWO receivers suitable for Novice use. Must be reasonably priced. C. Hockett, Ronan, Montana.

NEED: BC348 and BC342 radio receivers. Hoffman, 1406 G Street, N.W., Washington, D.C.

WANTED: Any amateur or war surplus radio equipment in trade for new Johnson Viking, Hammarlund, National, Harvey Well, Elmac, Gonset, Central Electronics, Hallicrafters, etc. Especially want Art-13, DY-17, BC348, BC312, BC342, BC610, BC728, BC939, GN-58, APN-9, Collins 310 exciter, 75A-1, 75A-2, 32V-1, 32V-2, 30-J, 30-K, panadaptors, manuals, teletype, Keyboard perforators. What have you to sell or trade? ALLTRONICS, Box 19, Boston 1, Mass. RIchmond 2-0048, 2-0916.

WANTED: Best prices to western Hams for R5/ARN-7, R5A/ARN-7, ARC-13, ARC-1. Write stating condition and price. W6AJU, 4354 LeBourget Avenue, Culver City, California.

Hamfests:

HAMVENTION is the best treat in Ham radio. On Saturday APRIL 3, The Dayton Amateur Radio Association will hold its annual Hamvention at the Dayton Biltmore. Write D.A.R.A., P.O. Box 44, Dayton 1, Ohio, for attractive brochure describing gala all-day affair.

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QSLs of DISTINCTION. Three colors and up. Uncle Fred. Box 86, Lynn, Pennsylvania.

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QSL's SEND $3.00 for 100 and be surprised, or 10c for samples. 24 hour service. Satisfaction guaranteed. CPS, Bladensburg, Maryland.

DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, New Jersey. Samples 10c.

QSL's, SWL's. High quality. Reasonable prices. Free samples. Write Bob Teachout, W1FSV, Box C124, Rutland, Vermont.

QSL's—SWL's. Bartinoski, Box 617, Houlton, Maine.

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QSLs, Taprint, Union, Massachusetts.

QSLs! "America's First Choice." Samples 10c. Tooker Press, Lakehurst, New Jersey.

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QSL's—SWL's. Excellent quality. Fair prices. Samples 10c. Almar Printing Service, 602 Barker Building Omaha, Nebraska.

QSLs??? Samples 20c. Sackers. W8DED, Holland, Michigan.

Wanted:

WANTED: Will buy or swap for BC-746, tuning units for channels 2, 3 or 65. Also have 5" RCA scope for trade. W9QJR, Freeburg, Illinois.

WE NEED USED RECEIVERS: We give highest allowances for S-20R; S-40A, B; NC-57, NC-100, NC-125 SX-24, SX-25, HQ-129 X and similar receivers. Write: World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

WE WANT USED GEAR. Highest trade-in allowance on National, Hallicrafters, RME, Hammarlund, Gonset, Morrow, Johnson, etc. Write or Call: C & G Radio Supply Co., 2502-6 Jefferson, BR 3181, Tacoma 2, Washington.

WANTED: TWO-METER transmitter complete. Also VFO. W4CKN, 2274 Hickory, Chamblee, Georgia.

WANTED: Sylsyns and amplidynes. G.E. control transformers, size 5, models 2J5FBI, 2J5DI, 2J5F1 or equivalent, 115/55v. 60. G.E. amplidynes-motor generators, input 115/230v 60—1 ph., output 250 VDC @ .6 amps or larger. Also need Type 5DG synchro differential generators, 6G generators, C78248 synchronous transmitters, electronic tubes, inverters, rate generators, autosyns and any other specialized rotating equipment. Advise quantity available, price and condition. We are interested in any quantity—small or large. Electro Sales Company, Inc., 50-58 Eastern Ave., Boston 13, Mass.

WANTED: AN/ART-13 transmitter and/or parts. Robert Wegelin, 410 Cedar Street, N.H., Washington, D.C.

WANTED: PR-15 receiver. W6PQQ, 321 "D" Avenue, Coronado, California.

Miscellaneous:

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NECKTIES—Your handle and call handpainted in contrasting colors on rayon satin, $3.25, nylon acetate, $3.75, pure silk, $4.75. Red, maroon, brown, gray, yellow, green, black, or royal powder or navy blue. No COD's. Prepaid. W3RRF, Henry Schanding, Harrington, Del.

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SCR-518 UHF ELECTRONIC ABSOLUTE ALTIMETER. Terrific for conversion to 420 MC and citizen's bands. Consists of transmitter, receiver, indicator, power supply, control boxes, cables with plugs, mounts, etc. Less tubes. BRAND NEW, plus schematic, never before priced so low. **ONLY $19.95**

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5BP4	$2.95	6V6	$ .65
6SN7	.75	6AC7	.62
813	6.95	6AK5	.60
832-A	4.95	1625	.59

METER: 0-25 ma. 2" rd. Weston New. Down to ONLY $2.49
METER: 0-15 V. AC. 2" rd. Westinghouse. New $2.95
METER: 0-9 amps RF 2" rd. Westinghouse. New $3.49
WESTERN ELECTRIC METER: 100-0-100 sale. 0-1 ma. each side of zero. 3" rd. New $3.95
DUAL METER INDICATOR: Has 2 individual movements each perpendicular to the other. One has 110 microamperes movement; other—210 microampere movement. Makes terrific "S" meter or field-strength meter. Dim.: 3¼x3 in. New $3.95
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No matter what else a receiver does, it must pull 'em in! And that's just what the NC-183D does! Compare its luv. sensitivity (on 6 meters) and extremely low noise level with the highest-priced amateur receivers made ($150 higher!) and you'll see why you'll hear more, log more on an NC-183D!

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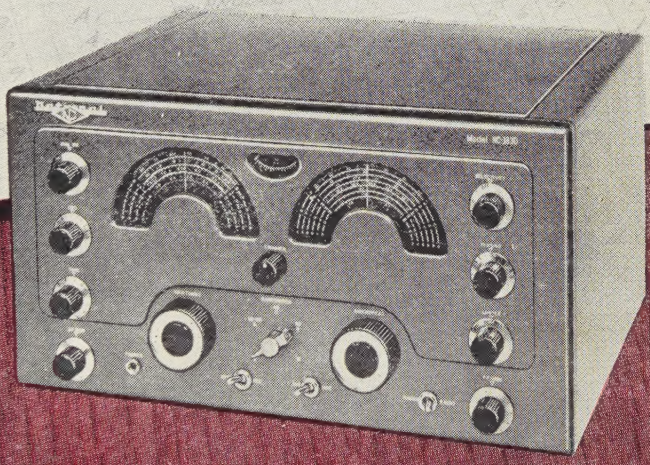

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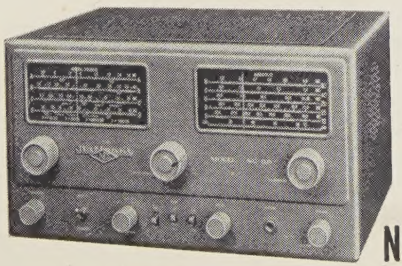

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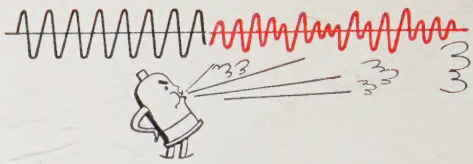
National Company, Inc., Malden, Mass.

see inside-then decide



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Proved on phone bands for years—and preferred by phone men for their reliability and peak power reserve—these RCA power tubes offer a wide choice of audio power outputs *for modulating r-f carrier powers up to a kilowatt!*

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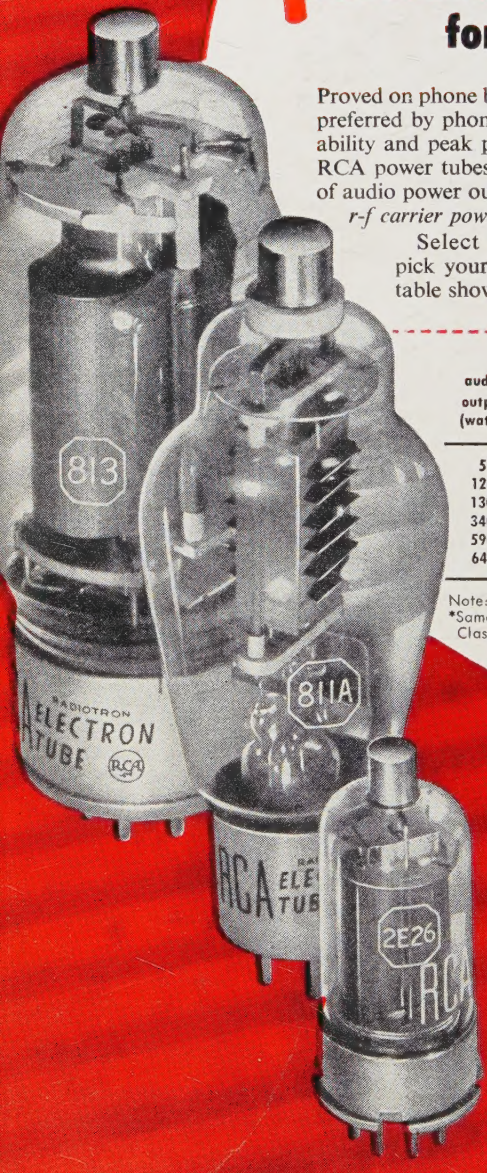
audio output (watts)	tube type	class of service	dc plate volts	driving power (watts)
54	2 RCA-2E26's	AB_2	500	0.4
120	2 RCA-807's	AB_2*	750	0.2
130	2 RCA-6146's	AB_2	750	0.4
340	2 RCA-811A's	B	1500	4.4
590	2 RCA-810's	B	2000	10
640	2 RCA-813's	AB_2	2500	0.4

Note: Max. values for amateur operation.
*Same output can be obtained, using special triode Class B connection and 5.3w driving power.



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